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A REVISION OF THE NEARCTIC SPECIES OF THE TRIBE PARYDRINI (DIPTERA: EPHYDRIDAE)

BY
PHILIP J. CLAUSEN
AND
EDWIN F. COOK

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A REVISION OF THE NEARCTIC SPECIES OF THE TRIBE PARYDRINI (DIPTERA: EPHYDRIDAE) [1, 2]

BY

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INTRODUCTION

Flies of the genus *Parydra* Stenhammar are rather humpbacked, acalyptrate Diptera belonging to the family Ephydridae or shore flies. The name *Parydra* is probably the result of an error in transliteration of the Greek word παρυδρος (παρ = par = by, near, beside; and υδρος, masculine = hydra = water) and should have been spelled *Parhydra*. Nevertheless, the name *Parydra,* as it was originally spelled, is the name we must use.

The genus is world-wide in distribution and some species are apparently widely distributed. Little is known of the biology of either

[1] A modification of a dissertation by the senior author submitted in partial fulfillment of the requirements for the degree of Doctor of Philosophy, University of Minnesota, Minneapolis.

[2] Paper No. 7168, Scientific Journal Series, Minnesota Agricultural Experiment Station, St. Paul, Minnesota 55101.

the immatures or adults. As the name *Parydra* indicates, they are found on muddy shores where both adults and larvae may feed on algae. None are of any known economic importance.

The classification of Ephydridae has been considered from the early 1900's to 1949 in a multitude of papers by E. T. Cresson, Jr. and by Sturtevant and Wheeler in a 1954 paper. However, Wirth (1965a) indicates that more work is necessary in the subfamily Parydrinae and especially within the genus *Parydra.*

Initially, Dr. Willis W. Wirth suggested that a comparative morphological study of the copulatory apparatus of selected nearctic species of the subfamily Parydrinae would contribute toward a better understanding of the group. After the senior author conducted this suggested study, it was apparent that a number of genera, including *Parydra,* seriously needed revision. It was also discovered that male genitalia offered excellent characters for species separation.

Many of the difficulties encountered with *Parydra* seem to result from inadequate descriptions coupled with a lack of illustrations. Also, the adult morphology has never been discussed in detail and, as a result, the terminology has not been consistent. Intra-specific variation in characters has not been given enough consideration, and genitalic characters have been neglected. In consideration of these shortcomings, a revisional study of the nearctic species of the genus *Parydra* follows with sections on biology, adult morphology, and taxonomy. This study also includes three genera in addition to *Parydra* since the species within these genera were once placed in *Parydra* and certainly appear to be related to it. *Parydra* and these genera would all be placed within the tribe Parydrini as listed by Wirth (1965b).

The taxonomic section contains keys to all genera, subgenera, species and subspecies described herein. Thirteen new species and one subspecies are described, while the existing nearctic species and subspecies are redescribed. Reference citations for all synonomies are provided except for catalogues and species lists. Illustrations of scutelli, and abdomens and genitalia of both sexes are provided in addition to wing pictures and distribution maps for most species.

A total of 8,996 specimens were examined during the course of this study. Most specimens were borrowed from museums, institutions, and universities but many were collected locally.

It should be understood that all nomenclatorial changes involved

in this paper are the sole responsibility of Clausen (not Clausen and Cook).

Acknowledgments

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R. Vickery, Macdonald College, Quebec; Dr. George E. Wallace, Carnegie Museum; Dr. Marshall R. Wheeler, University of Texas; Dr. Willis W. Wirth and Dr. Donald R. Davis, United States National Museum; and Dr. P. Wygodzinsky, American Museum of Natural History.

Finally, the senior author wants to thank his wife, Lynette, and his sons for their help, encouragement, and patience during the preparation of this manuscript.

Methods

All characters used by previous workers and a multitude of additional characters were recorded on data sheets. The final data sheets, upon which the characters for each species were to be recorded, were 12 pages long. The first two pages provided space for recording the species name, types, type data, references to descriptions, notes on illustrations made, and biological data. On page 3, space was provided for recording a number of measurements for the head, thorax, legs, wings, and abdomen of the type, 4 males, and 4 females. Space for wing vein ratios was provided on page 4. Pages 4-12 included a list of all of the characters of probable importance for the head, thorax, legs, abdomen, and wings with space provided to record the details of these characters for the type, 4 males, and 4 females. Attached to the data sheet were sheets upon which all of the locality data, sex, number, collector, and date was listed for each specimen of that species which was examined. From these data sheets it was possible to determine the amount of variation present for each character listed.

Adult specimens were borrowed from numerous institutions and some were collected in the field, and these specimens were then studied and separated into species groups, primarily on the basis of external characters. If any difficulties were encountered in identification, male and female abdomens and genitalia were examined in detail.

Since almost all of the specimens for which the abdomens and genitalia were examined were pinned or point-mounted, it was necessary to relax the specimens prior to removing the abdomen to prevent damage. Specimens were relaxed by sealing them for several hours in an airtight container with moist cotton treated with carbolic acid.

When the specimens were relaxed, the abdomens were removed from the thoraces using fine, jeweler's forceps. The abdomens were then placed in small beakers containing a warm 10% solution of KOH for several minutes to dissolve the internal tissues. Abdomens were then transferred to distilled water where they were rinsed, and tracheae and gut contents were removed. The cuticle of many species was very dark and internal morphological details were often obscured. Consequently, the very dark abdomens were placed, for several seconds, in beakers containing warm 30% hydrogen peroxide. When sufficiently cleared, they were rinsed in distilled water and then placed in 95% ethyl alcohol to remove bubbles. Next, they were transferred to glycerin-filled, depression slides for examination and further dissection.

In studying the general morphology, entire specimens, except wings, were cleared in the above manner.

Any necessary illustrations were made while the specimens were in glycerin. Gross drawings were made first and then further dissections were made where necessary. In females, the ventral receptacle was carefully removed from the abdomen and illustrated while in males the copulatory apparatus was removed and drawn. All drawings were made using a stereo dissecting microscope fitted with an ocular grid and heavy, tracing vellum with a grid paper beneath. All setae of no apparent value were omitted from the abdominal and genitalic illustrations.

After examination and illustration, all dissected parts were placed in a microvial and returned to the pin which supported the remainder of the insect and data labels.

Wings were photographed under a compound microscope, fitted with a single-lens reflex camera. The wing was removed from the specimen, placed on a microscope slide, when necessary wetted with water and unrolled, covered with a coverslip, photographed, dried, and cemented to a point which was placed on the pin with the remainder of the insect from which it was taken.

Biology

The biology of a few Ephydrids is well known, especially those species found in rather unusual habitats. For example, the biology

of Ephydrids which inhabit saline or alkaline lakes, those found in hot springs, some leaf-mining species, and of *Helaeomyia petroli* (Coquillett), which is found in crude oil pools, is well documented. However, very little is known of the biology of most Ephydrids and especially those of the genus *Parydra*.

Nielson, Ringdahl, and Tuxen (1954) illustrate the larva of *Parydra pusilla* Meigen and mention that it is found in moist places such as bogs, rivulets, hot springs, and swamps. Dahl (1959) includes a discussion of a number of Scandinavian *Parydra* (*Napaea* as he considers it) but mentions only the type of substrate upon which each species is found. Deonier (1965) apparently followed Dahl's work and includes a number of species of *Parydra* for which he lists the percent presence and estimated abundance for each species on a number of substrates. In general, he found many species to be most abundant on the limnic wrack, mud shore, and sand shore habitats.

Throughout these studies, the senior author has attempted to collect *Parydra* around swamps, ponds and lakes. He has had little success in these habitats and only an occasional specimen can be captured. However, when one collects along streams or rivers, specimens of many species can be captured in great numbers. Consequently, it is believed that *Parydra* are generally stream-inhabiting forms, but Dahl (1959) and Deonier (1965) both fail to mention this.

The adults can most commonly be observed on moist muddy surfaces near or at stream margins. They prefer warm, sunny areas which are sheltered from the wind. Their movements while walking are slow and they appear to be reluctant to fly. If they do fly, it is only for short distances, and in flight they remain very close to the surface of the mud or water. Adults may often be seen walking on the water for short distances. They appear to graze the surface of the mud where they probably obtain algae as food. Thus far, we have been unsuccessful in determining what algae are included in the diet.

An examination of gut contents is of little help since any algae contained therein are so badly damaged that they are unidentifiable. However, evidence does indicate that they feed on algae. Tuxen (1944) illustrates the pseudotracheae of *Scatella thermarum* Collin and discusses the function of the pseudotracheae in scraping several species of algae from rocks for food. Zavattari (1921) pictures the

pseudotracheae of *Ephydra bivittata* Loew and mentions its eating a species of algae. *Ephydra subopaca* Loew consumes algae as its major dietary constituent (Ping, 1921). Dahl (1959) and Deonier (1965) both present detailed discussions of the habitats upon which *Parydra* are found and they mention the fact that these habitats are rich in various algal species. Since *Parydra* have pseudotracheae much like those of algal feeding Ephydrids and they are abundant on algal rich substrates, it appears likely that their diet consists of living or dead algae.

The senior author has observed several matings but has never seen any courtship or display performances. Males frequently pounce upon females or other males, apparently in an attempt to mate. When a male finds a receptive female, she spreads her wings. The male often taps or rubs her abdomen with his metathoracic tarsi and copulation ensues. During mating, the male perches on the thorax and abdomen of the female, but slightly behind the wing bases of the female.

When the females of any of several species are confined to vials with about 1 centimeter of stream mud on the bottom, eggs are occasionally laid. The eggs are always placed on the side of the vial, about 1 centimeter or more above the surface of the mud. They are white and embedded in a cream-colored, granulose matrix. All the eggs in the cluster are parallel and identically oriented so that all larvae emerge on the same side of the egg mass. *Parydra aquila aquila* and *P. quadrituberculata* produce clusters of 1 to 8 eggs while *P. breviceps* and *P. parasocia* deposit them in clusters of 1 to 3 eggs. The eggs of the former species are about 0.8 mm long and those of the latter are about 0.6 mm long.

In the field, eggs are usually found on rocks along stream margins (Fig. 222), but where there are no rocks they may be found on fallen tree leaves and branches. Whether placed on rocks, leaves, or branches, they are always above the level of the moist substrate. While walking along a stream, one can easily spot the tiny, white, egg masses which are very conspicuous against their darker backgrounds.

The eggs usually hatch in 2 or 3 days but all attempts to rear the larvae failed. However, there are probably three larval instars with pupation occuring within the last larval skin, as is the case with other Ephydrids and higher Diptera.

The tiny first instar larvae of *P. quadrituberculata* are white and

covered with reddish-brown setae. Anteriorly, long mouth hooks are apparent while two, short, spiracular horns are conspicuous posteriorly. The mouth hooks are separate and untoothed, and the spiracular horns are bare except for an apical ring of setae around the spiracular plate. In general, they are very similar to the larvae of *P. pusilla* as illustrated by Neilson, Ringdahl, and Tuxen (1954).

Adult Morphology

Most papers dealing with Ephydrid taxonomy fail to present any discussion on morphology except that included in the descriptions of taxa. The few publications with discussions on external morphology fall short of covering all aspects in detail. Zavattari (1921) presents numerous illustrations of internal and external morphology of all stages of *Ephydra bivittata* Loew. However, Zavattari's drawings are rather crude, his terminology is primitive, and he fails to include adult chaetotaxy. Tuxen (1944) illustrates the head, mouthparts, wings, portions of legs, and male genitalia of several species of *Scatella,* but he fails to label drawings and his morphological discussion lacks detail. In 1959, Dahl includes some morphology on the head, mouthparts, legs, and male and female abdomens of many Ephydrids. He also presents limited illustrations on the chaetotaxy of the head and thorax of a generalized Ephydrid. Nevertheless, Dahl's illustrations are diagrammatic, he fails to illustrate male abdomens or genitalia, and his discussions lack detail. Deonier (1964) illustrates *Ephydra riparia,* labeling most of the significant setae of the head and thorax, and naming most of the pleural sclerites of the thorax.

A number of authors have considered certain morphological areas of a few selected species of Ephydrids in detail. Peterson (1916) includes drawings and discussion on the head and mouthparts of *Ochthera mantis* and Frey (1921) discussed the mouthparts of several species of Ephydridae. Strickland (1953) describes the ptilinal armature of four species of Ephydrids. Becker (1896 & 1926) and Grünberg (1910) illustrates the heads, wings and thoracic chaetotaxy of a number of species; Young (1921) included an illustration of the lateral aspect of the thorax and preabdomen of *Parydra limpidipennis*; Curran (1934) contains many drawings of heads and wings of many species; and Cresson (1934) illustrates the heads, wings, and

scutelli of several species of *Beckeriella*. Séguy (1934) included some drawings of heads, mouthparts, thoracic chaetotaxy, and many wing pictures. Cole (1927) illustrated and described the genitalia of several species of Ephydrids. Collin (1930) illustrated the tergite 9 + surstyli of three species of *Scatella* and used the differences as characters for separating the three species. Bolwig (1940) illustrated the internal and external reproductive organs of *Scatophila unicornis* but the drawings were crude. Later Wirth (1948 and 1964) and Frey (1958) illustrated portions of the genitalia and used them in separating species of several genera of *Ephydrids*. Grigarick (1959) illustrates male and female abdomens, wings, and setal placement on the thoracic dorsum of *Hydrellia griseola* but gives no morphological discussion.

In view of the absence of detailed morphological studies on Ephydrids, a detailed study of *Parydra quadrituberculata* Loew will follow. It is hoped that this discussion will not only be useful in the included revision of the genus *Parydra* but also to taxonomists working on other Ephydrids.

It should be mentioned that the morphological terms contained herein are primarily those of Crampton (1942) and Kim and Cook (1966). Commonly used taxonomic terms are placed in parentheses after the morphological term.

Sexual dimorphism is very slight except for differences in the postabdominal structure, and in one species of each of the genera *Parydra* and *Callinapaea* where there is a difference in setal density on the mesofemur.

Head (Figs. 1, 2, 3, 6 and 8)

The head capsule of *Parydra, Callinapaea, Eutaenionotum,* and *Rhinonapaea* is basically spheroidal, but compressed in the cervical region and truncate at the oral margin. Anteriorly the head capsule consists almost entirely of the frons (Fig. 6) which is divided above the antennae by the ptilinal suture into the upper area or postfrons (front) and the lower area or prefrons (face).

The postfrons may be subdivided into two areas, the orbit and the front. The orbit is the narrow strip along the anterodorsal margin of the eyes and the front is the area between the two orbits (Figs. 3 and 6). One distinct row of small to large setae is borne on the

orbit near the margin of the compound eye and these are collectively called the orbital setae (orbitals or fronto-orbitals). Several indistinct rows of small setae are borne on the front near the orbital margins and are called the frontal setae. Within the front lies an area known as the frontalia or frontal vitta which is poorly defined in *Parydra* and can most readily be noticed by color differences in the pruinosity of the frontalia and surrounding areas. The dorsal-most portion of the head is often called the vertex, and the vertex bears two pair of setae, the inner vertical setae and outer vertical setae (Fig. 3). Three ocelli are located on a raised area or tubercule on the vertex which may be called the vertical triangle or ocellar triangle. Several sets of setae are located on the ocellar triangle: an anterior pair of large ocellar setae, 1 or 2 pairs of interocellar setae, and several pairs of postocellar setae (Fig. 3).

The ptilinal suture is the only anterior suture and extends from above the antennal bases to a point below the compound eye (Fig. 1). As several workers have mentioned (Crampton 1942, Ferris 1950, and Kim and Cook 1966), the ptilinal suture is not the frontal suture of lower insects as used by Peterson (1916).

The prefrons (face) is very large and prominent. On the prefrons, between the antennal foramina and the ptilinal suture, is a very narrow sclerite of questionable origin known as the frontal lunule. Between and slightly below the antennal foramina is the facial carina (facial protuberance used herein) which is not a keel or ridge in *Parydra, Callinapaea, Eutaenionotum* or *Rhinonapaea* as the name implies, but is reduced to a small rounded protuberance. Below the antennal foramina and on each side of the facial carina (facial protuberance) are slight concavities, the facial cavities, in which the antennae often rest. A slight ridge is located along the lateral margins of the prefrons, below the facial cavities. On each of these ridges (Figs. 1 and 6) there is a row of setae with the dorsal setae usually being the largest. At this point we encounter problems in naming the ridge and the setal row. One of the characters listed for the family Ephydridae is the absence of distinct oral vibrissae, and with this we must agree since there is no vibrissal angle. Cresson (1949) considers the above mentioned setal row as being on the facialia which is a term considered by Crampton (1942) as synonomous with facial ridge. If we consider the ridge as the facial ridge, the

setae borne thereon become vibrissae by definition. More recently Sturtevant and Wheeler (1954) and Wirth (1965a) consider the setae as facial setae. The senior author does not fully approve of this term because it gives no indication as to the location of these setae on the face, and many Ephydrids have setae placed elsewhere on the prefrons. The term parafacial setae seems to be more descriptive, but the parafacial area by definition (Crampton, 1942) lies between the ptilinal suture and the compound eye, not on the facial side of the ptilinal suture. However, it seems possible that these setae are in fact the parafacials and the prefrons has expanded to encompass them. This seems especially likely since the prefrons is very large in *Parydra* and many other Ephydrids. The opening of the anterior tentorial pit is not apparent externally but is located below the gena, near the lateral-most extensions of the prefrons (Fig. 1).

The area below the eye and above the posterior extension of the prefrons is the gena and may be subdivided into 3 areas, the supra-, infra-, and subgena. These areas are not at all well defined in *Parydra* but the infragena is marked by the location of the large, anterior-projecting, infragenal seta (Fig. 1).

The antennae (Figs. 1, 3 and 6) are each composed of 3 large basal segments and an arista which appears to have 2 segments. The first segment, the scape, is very narrow and ring-like. The pedicel, which is the second segment, is much larger than the first and somewhat conical in shape. Apically, the pedicel bears a large dorsal seta and several large ventral setae. The third segment, the flagellum (postpedical of Frey, 1921) is larger than the second and spheroidal. Dorsolaterally, the flagellum bears the arista. The arista consists of a small, short, ring-like, basal segment and a long, flagellate, terminal segment which is bare to slightly plumose.

Posteriorly, the head capsule is composed of a median sclerite, the occiput, which extends dorsally from the occipital foramen to the vertex and laterally to the premandibular suture. The premandibular suture runs vertically from the occipital foramen to a point near the vertex where it angles outward towards the compound eyes. The large area lateral to the premandibular suture, extending laterally to the eyes and ventrally to the posterior tentorial pits, is called the postgena. The postoccipital suture (postoccipital sulcus of Snodgrass, 1960) circles the occipital foramen dorsally and joins to the

posterior tentorial pits laterally. The suture has a sharp dorsomedial peak which projects into the occiput. The posterior tentorial pits are very long and narrow, and extend obliquely from the occipital foramen towards the posterior-lateral margins of the head capsule. A small cervical condyle (Bonhag, 1951) is located on each side of the occipital foramen between the premandibular and postoccipital sutures. The hypostomal bridge (Snodgrass, 1935 and Bonhag 1951 equals the maxillary segment of Ferris, 1950 and Hoyt, 1952) connects the postgenae below the occipital foramen. The setae on the posterior of the head capsule are very small. There is a dense cluster of setae on the base of the occiput, just above the postoccipital suture on each side of the peak, which are the occipital setae (Ferris, 1950). A number of postorbital setae may be found on the postgena.

The mouthparts are a large and conspicuous portion of the head of *Parydra,* and they are basically of the nonpiercing muscoid form. The mouthparts or proboscis may be subdivided into three parts; the basiproboscis or rostrum, the medioproboscis or haustellum, and the distiproboscis consisting of the labial palpi or labella.

The basiproboscis is composed of the clypeus, fulcrum, maxillary palpi, cardo-stipital rods, maxillary endite, and the labrum (Figs. 1 and 8). The clypeus (tormae of Peterson, 1916) is a large, narrow sclerite which extends anteriorly and laterally around the oral margin of the head capsule, and is often partially withdrawn into the oral margin of the head capsule. The clypeus is attached by a membrane to the dorsal prefrons and ventral labrum. Posteriorly, the clypeus is fused to the fulcrum. The fulcrum (Figs. 1 and 8) of *Parydra* is an intricate internal sclerite which is mostly contained within the head capsule, but distally articulates with the proximal labial plate and the labrum. The maxillae of *Parydra* are very reduced. The maxillary palpi are present and long with one large subapical seta, and numerous other long and short setae. The base of the palpus is very narrow and pointed, and it seems to be associated with the Y-shaped, cardo-stipital rod or cardo-stipes (Hoyt, 1952) (Fig. 1). Fused to the anteroventral branch of the Y-shaped cardo-stipital rod is an elongate lobe which may be either the galea or lacinia. It is impossible to determine whether the lobe is the galea or lacinia but since it is definitely an endite lobe of the maxilla, we prefer to consider it as the maxillary endite (Hoyt, 1952 and Matsuda, 1965 = maxil-

lary lobe of Ferris, 1950). The base of the labrum articulates with the anterodistal lobe of the fulcrum. The labrum is basically triangular in shape, often with a pointed apex and bearing variously placed round sensillae (Fig. 1). The labrum forms the anterior or dorsal cover for the food channel as the epipharynx is formed by the sclerotized inner surface of the labrum. The oral opening is at the base of the labrum. The mandibles are absent in *Parydra*.

The medioproboscis consists only of the sclerites of the labium, excluding the labial palpal segments. The sclerites of the medioproboscis are the proximal labial plate, labial lonchus, anterior labial plate, and prementum (Figs. 1 and 8). The proximal labial plate is a small, ellipsoidal sclerite which connects the fulcrum and the anterior labial plate. On the anterior surface and near the base of the anterior labial plate is a small triangular sclerite, the labial lonchus (Hoyt, 1952) called the hypopharynx by Peterson (1916), Frey (1921), Snodgrass (1935), and Crampton (1942). Ferris (1950) called it the salivary stylet, and Matsuda (1965) called it the hypopharyngeal stylet. Beneath the labial lonchus and attached basally to the proximal labial plate is a long, trough-shaped sclerite known as the anterior labial plate (Hoyt, 1952). At the apex of the anterior labial plate are two small, lateral sclerites of the distiproboscis known as the labial sclerites (labial sclerite of Kim and Cook, 1966). The posterior of the mediproboscis is enclosed by a very large, hemispherical sclerite known as the prementum by Hoyt (1952) who indicates that the mentum is lost. The prementum of *Parydra* is covered with numerous small setae (Fig. 1).

The distiproboscis is composed of the labial sclerites, 2 labial palpal segments, and the pseudotrachaea (Figs. 1 and 8). The labial sclerites are very small and connect the anterior labial plate with labial palpal sclerite 2. Hoyt (1952) considers these labial sclerites as fragments of the labial palpal segment 1. Labial palpal segment 1 may consist of either a single large sclerite which extends around the posterior of the proboscis or two lateral sclerites with a narrow suture on the midline of the posterior of the proboscis. Labial palpal segment 2 is divided into two lateral fragments which bear the pseudotracheae. Crampton (1942), Hoyt (1952), and Kim and Cook (1966) consider these segments as labial palpal segments 1 and 2, but Peterson (1916), Frey (1921), and Matsuda (1965)

consider them as the furca and epifurca respectively. The pseudotracheae are borne on labial palpal segment 2 and are very complex structurally. Ephydrid pseudotracheae have been illustrated by Peterson (1916), Frey (1921), Zavattari (1921) and Tuxen (1944). The thickenings of the pseudotracheae are very long and appear to be similar to those illustrated by Tuxen (1944) with a hair-like process near the tip but no apical spines. Tuxen called the thickenings "scrapers".

The head is attached to the thorax by means of two triangular sclerites, the cervical sclerites (Figs. 1, 3 and 6), which articulate anteriorly to the cervical condyles of the head capsule and posteriorly to pre-episternum I of the thorax. Though the cervical sclerites are believed to be of prothoracic origin, we have discussed them in connection with the head because they have been so illustrated in the plates.

Thorax (Figs. 2, 4 and 5)

The terminology used here follows that of Ferris (1940 and 1950), Matsuda (1960) and Kim and Cook (1966). As in Diptera in general, the prothorax and metathorax are greatly reduced in *Parydra, Callinapaea, Eutaenionotum* and *Rhinonapaea,* and the mesothorax with the powerful flight muscles constitutes the bulk of the thorax. The only sclerites of the prothorax that can be recognized are the pre-episternum, humerus, and katepisternum. The pre-episternum is a narrow sclerite surrounding the anterior thoracic foramen, and the humerus or humeral callus is found on each side of the prescutum anterior to the mesothoracic spiracle. A number of small setae are found on the humerus. The katepisternum is a triangular sclerite located between the coxa and the midventral line. The two katepisternal sclerites meet along the midventral line, and in *P. quadrituberculata* each bears a large curved spine, the katepisternal spine, on the margin adjacent to the coxa (Fig. 5). The midventral line may indicate the point of invagination of the sternal sclerites (Kim and Cook, 1966).

The mesothorax may be divided into a dorsal area, the mesonotum, and a pleural area, the mesopleuron. The mesonotum covers most of the dorsal surface of the thorax and may be divided into four regions: the prescutum, scutum, scutellum, laterotergite (meta-

pleuron), and mediotergite (postscutellum) (Figs. 2 and 4). The prescutum is bounded anteriorly by the prescutal suture, laterally by the notopleural or dorso-pleural suture, and posteriorly by the incomplete intrascutal suture. On each side of the prescutum, there is a cluster of small posthumeral setae, several small and often one large presutural setae, and two large notopleural setae with the posterior seta being the largest. The scutum lies behind the prescutum above the wing bases, and anterior to the scutellum.

Laterally, the scutum bears several rows of small intraalar setae with a large posterior intraalar seta. This large posterior intraalar seta has previously been known as the supra-alar seta by many authors (recently, Dahl, 1959; Deonier, 1964; and Wirth, 1965a) but I believe that this seta in *Parydra* is situated too far to the posterior to be the supra-alar. Evidently, Cresson (1949) believed this also as he lists no supra-alar setae in his morphological discussion of his genus *Parydra* but instead lists postalar setae. Cresson's interpretation seems to agree with those of Sturtevant (1921) and Ferris (1950) on Drosophilidae and that of Kim and Cook (1966) on Sphacroceridae. However, the senior author maintains that this seta is actually a member of the intraalar series and not separate as indicated when called the postalar seta.

On the scutum but near its junction with the scutellum, there is a large seta placed between the intraalar series and the dorsocentral series. The senior author has named this seta the prescutellar seta. Recently Dahl (1959), Deonier (1964), and Wirth (1965a) call this seta an intraalar, but Cresson (1949) indicates it as being the prescutellar dorsocentral. Since it is prescutellar in position but clearly not in line with the dorsocentral row, the senior author prefers to consider it as the prescutellar seta.

The scutellum (Figs. 2, 4 and 5) is a large, posterior-projecting sclerite which extends well beyond the junction of the thorax and the abdomen. Two pairs of large setae and a number of small setae are borne on the scutellum. The two large setae located near the apex of the scutellum are the apical scutellar setae, and the two lateral or dorsolateral setae are the lateral scutellar setae. Boh of these pairs of setae may have large tuberculate bases. The apex of the scutellum, between the apical scutellar setae, may have a small to large, variously-shaped, process which we have termed the apical scutellar

process. Cresson (1949 and in many previous papers) calls this process the "apical, unarmed, scutellar tubercule" and Sturtevant and Wheeler (1954) consider it as the apical papilla. Since Cresson's name for the process may be confused with the armed or setose tubercules, and since the word papilla means "a soft projection" which the apical process certainly is not, we prefer the term, apical process.

The postnotum is located below the scutellum and the posterior portion of the scutum. The postnotum is divided into two lateral sclerites, the laterotergites (metapleuron), and a large median sclerite, the mediotergite (postscutellum), which posteriorly joins the two laterotergites (Fig. 2).

The pleural area of the mesothorax consists of an anterior area, the episternum, and a posterior area, the epimeron, which are separated by the pleural suture. The episternum is subdivided into the anepisternum, pre-episternum, and katepisternum and all three are evident (Figs. 2 and 5). The anepisternum (mesopleuron) is defined dorsally by the notopleural or dorsopleural suture and ventrally by the anepisternal suture. The pre-episternum is a large lateroventral sclerite delineated dorsally by the anepisternal suture, anteriorly by the coxal cavity of the prothorax, posteriorly by the pleural and precoxal sutures, and medially by the midventral line. The katepisternum is a very narrow, ventral sclerite located just anterior to the mesothoracic coxal cavity, and defined anteriorly by the precoxal suture and posteriorly by the coxal cavity. The anepisternum and pre-episternum both bear a number of small setae and often one seta is very large on each sclerite. The anepisternal setae are called the sternopleural setae (Fig. 2).

The epimeron is subdivided into the anepimeron and the katepimeron (Fig. 2) by the anepimeral suture. Near the antero-dorsal margin of the anepimeron is a small sclerite known as the prealar apophysis while near the posterior-dorsal margin is a triangular subalar (Fig. 2). No mesothoracic sternites are visible.

The metathorax is considerably reduced, but anteriorly a small anepisternum, below the katepimeron II, and a large, ventral episternum are still evident (Figs. 2 and 5). Posterior to the pleural suture which extends from the spiracle to the coxal cavity is a long, narrow, triangular sclerite which is all that remains of the epimeron (Figs 2 and 5). No metathoracic sternites remain.

The legs of *Parydra* are typical of those of most acalyterate Diptera and each possesses a coxa, trochanter, femur, tibia, and five tarsal segments (Fig. 9). The only setae of apparent taxonomic importance are those located at the apex of the tibia of each leg and the posterior flexor row of setae of the mesothoracic legs.

In *Parydra,* the wing venation and color often provide good specific characters. The terminology used herein for wing venation follows the Comstock-Needham system (Fig. 184). The costa extends to the M_{1+2} and has two breaks, 1 near the humeral crossvein (h) and one near the Junction of R_1 and the costa. The subcosta is rather indistinct but can be seen lying close to the R_1, just beyond the humeral crossvein. The R_1 is short and distinct. The R_2 and R_3 are fused to form the R_{2+3}, and likewise the R_4 and R_5 are fused to produce the R_{4+5}. The first two medial veins are fused, forming the M_{1+2}. The third medial vein has fused with the cubital vein to produce the $M_{3+}Cu_1$. In addition to the humeral crossvein, two other crossveins are found. The r-m or anterior crossvein joins the R_{4+5} with the M_{1+2}, and the m or posterior crossvein joins the M_{1+2} with the $M_{3+}Cu_1$. Numerous setae are found along the costa but none appear to be of any taxonomic importance. The wing base of *Parydra* is very complex and I have not attempted an interpretation of its morphology.

In some specimens of some species, there is a small appendage situated near the apex of the R_{2+3}. The presence of this appendage has been used as a character in species recognition in the past, but there is considerable variability in the occurrence of this appendage. It seems to be usually present in some species, usually absent in others, totally absent in some, and occasionally a specimen is encountered with the appendage present in one wing but lacking in the other. Consequently, it is not a reliable character for species identification.

The metathoracic halteres (Fig. 7) are composed of a scabellum, pedicel, and a capitellum. The basal scabellum and the basal portion of the pedicel both have two small sclerites and a set of sensoria. The sensoria appear to be very complex in structure and similar to those illustrated by Kim and Cook (1966). The capitellum is membranous and without any sclerites, but it bears 2 sets of tiny setae and is covered with microtrichia.

Abdomen (Figs. 10-143)

In this section, the senior author has almost exclusively used the terminology of Crampton (1942) except that he has used the term gonites rather than gonopophyses and gonal arch for a sclerite which posteriorly connects the paired gonites.

Crampton considered that primitive Diptera have 11 abdominal segments with the first 8 segments each having a pair of spiracles. However in *Parydra* and related genera, one can observe a maximum of 8 tergites, 9 sternites, and the cerci in the females of some species; and 6 tergites, 7 sternites, and the cerci in the males of some species. Both males and females have only 6 pairs of spiracles with 1 pair in or associated with each of the first 6 segments.

The abdomen of both males and females may be divided into the preabdomen and postabdomen (Crampton, 1942). The preabdomen consists of the first 5 segments and the segments posterior to the fifth are contained in the postabdomen. The postabdomen of males is highly modified while that of the females is reduced, and such is the case with *Parydra*. The preabdomens of both males and females are morphologically the same and will be discussed together, but the postabdomens will be discussed separately.

The preabdomen of both sexes consists of 5 segments and the tergites of these segments are always present. Tergite 1 is never fused to the second as was illustrated by Young (1921), but has a narrow dorsal sclerite and two, somewhat triangular, lateral sclerites. Tergites 2 through 5 are similar and extend around the dorsum and pleurum. There appears to be a fine lateral suture across tergites 2 through 5 in some specimens of most species (Figs. 14 and 16 for example). Spiracle 1 is located in the membrane near each of the triangular lateral sclerites, and spiracles 2 through 5 are situated within their respective tergites but near the ventral tergal margins. Sternite 1 is occasionally missing or greatly reduced, and when present may be variously shaped. Sternites 2 through 5 are apparently always present but variously shaped. Sternite 5 in some species is closely associated with the genital apparatus.

The male postabdomen of *Parydra* and related genera is highly modified and most of the segments are no longer apparent. There is no rotation of the postabdomen but tergites 6 through 8 are ap-

parently absent. The only visible tergite is that of 9 and with it are fused the paired surstyli (Figs. 10-43 and 76-111). In *Callinapaea aldrichi* the paired surstyli are not only fused to tergite 9 but are also fused to each other along the midventral line (Figs. 41 and 109). Sternite 6 is apparently present in some species of *Parydra, Eutaenionotum guttipennis,* and *Rhinonapaea metallica* and closely associated with the paired gonites. Apparently in *Callinapaea aldrichi,* sternites 6 and 7 are present but only 7 is connected to the gonites (Fig. 109). The only visible postabdominal spiracle is that of segment 6 which lies in the membrane between tergites 5 and 9. The genitalic components are the aedeagus, aedeagal apodeme, paired gonites, in some species a gonal arch, and in a few species an accessory aedeagal sclerite of unknown origin (Figs. 76-111). In some species the aedeagus and aedeagal apodeme are fused, and this is usually the case in the species of the subgenus *Chaetoapnaea.* A gonal arch, which posteriorly joins the paired gonites, is usually present in the subgenus *Parydra* but usually absent in *Chaetoapnaea.* From what the gonal arch is derived is unknown. The paired gonites are variously shaped and sometimes bear long setae. The genitalic components provide excellent characters for species separation.

The postabdomen of females of *Parydra* and related genera (Figs. 44-75) is considerably reduced, but not elongated as in many higher Diptera (Crampton, 1942). Tergites 6 through 8 are present but usually much narrower than those of the preabdomen. Only the paired cerci remain posterior to tergite 8. Sternites 6 through 8 are always present and variously shaped, and in a few species a ninth sternite may be found. The genital opening lies posterior to sternite 8 and anterior to 9 where present. The only postabdominal spiracle is that of segment 6 and it is found in tergite 6 near the ventral tergal margin. Internally one finds a single sclerotized receptacle which Sturtevant (1926) calls the ventral receptacle. He notes that in addition to the sclerotized ventral receptacle there are two dorsal, unsclerotized spermathecae but the only sperm found are contained in the ventral receptacle. The ventral receptacles of *Parydra* and related genera (Figs. 112-143) are variously detailed but basically mushroom-shaped and consist of a large, inward-folded sack. The sternites of the postabdomen and ventral receptacles provide reasonably useful characters for species separation.

Taxonomy

Key to the Nearctic Parydra and Related Genera

1. Anterior crossvein (r-m, Fig. 184) located directly below junction of R_1 and costa, and/or anterior crossvein intercepting R_{4+5} at 1/5 or less of distance from junction of R_{4+5} and R_{2+3} to costa, costal section of wing from R_1 to R_{2+3} 2.8 to 6.0 times distance from R_{2+3} to R_{4+5}, wings as in Figs. 218 through 221, rare 2

   Anterior crossvein located distinctly beyond junction of R_1 and costa, and anterior crossvein intercepting R_{4+5} at 1/4 or more of distance from junction of R_{4+5} and R_{2+3} to costa, costal section of wing from R_1 to R_{2+3} 0.6 to 3.3 times distance from R_{2+3} to R_{4+5}, wings as in Figs. 185 through 217, common ..... *Parydra*

2. Costal section of wing from R_1 to R_{2+3} 2.8 to 3.9 times the distance from R_{2+3} to R_{4+5}, wings as in Figs. 220 and 221 3

   Costal section of wing from R_1 to R_{2+3} 4.7 to 6.0 times distance from R_{2+3} to R_{4+5}, wings as in Figs. 218 and 219 ..... *Callinapaea*

3. Orbital setae small, about 1/6 the length of either inner or exterior vertical setae, male abdomen and genitalia as in Figs. 42 and 110, female abdomen and ventral receptacle as in Figs. 74 and 142, wing as in Fig. 220 .... *Eutaenionotum* [*Eutaenionotum guttipennis* (Stenhammar)]

   Orbital setae large, subequal in length to either inner or exterior vertical setae, male abdomen and genitalia as in Figs. 43 and 111, female abdomen and ventral receptacle as Figs. 75 and 143, wing as in Fig. 221 .... *Rhinonapaea* [*Rhinonapaea metallica* (Cole)]

Genus PARYDRA Stenhammar

Napaea Robineau-Desvoidy, 1830:799. (preocc. Hübner, 1819:pl. 34, as listed in Hemming 1937 (1): 330, 339-340, 413, 442 and Hemming 1937 (2): 87, 98, 100, 122, 228). Type-species, *Napaea stagnicola* Robineau-Desvoidy, 1830:799-800 = *Ephydra coarctata* Fallén (Westwood 1840: 153). Haliday 1939:407; Hendel 1910:312; Cresson 1918:64; Tullgren and Wahlgren 1920-1922:542; Becker 1926:98-99; Mercier and Tolmer 1928:33; Cresson 1930:105-107; Hendel 1930:147-150; Cresson 1934: 211-212; Séguy 1934:441; Duda 1942:36-37; Cresson 1949:226-228; Sturtevant and Wheeler 1954:216-217; Dahl 1959:130-131.

Napaea sensu Rondani *nec Napaea* Robineau-Desvoidy, Rondani 1856:130.

Ephydra Fallén (*partim*). Fallén 1813:246; Fallén 1823:3; Meigen 1830: 113-114; Macquart 1835:535-536; Westwood 1840:153; Zetterstedt 1840: 715; Zetterstedt 1846:1805-1806; Walker 1853:259.

Ephydra sectio *Parydra* Stenhammar 1844:187. Type-species, *Ephydra aquila* Fallén (Coquillett 1910:585).

Parydra Stenhammar. Loew 1860:31; Loew 1862:164; Schiner 1864:33; Becker 1896:208-209; Grünberg 1910:291-292; Cresson 1930:105-106; Cresson 1931:103; Cresson 1934:214; Cresson 1949:238-240.

Parhydra [= *Parydra* Stenhammar] Hendel, 1930:149; Hendel 1931:15-16.

The nomenclature of the genus *Parydra* is rather complex and deserves a detailed discussion at this point.

Early taxonomists described a number of species within the genus *Ephydra*, some of which were ultimately placed within the present genus *Parydra*. Fallén (1813) described *aquila* and *coarctata* as species of *Ephydra* and he discusses them again in 1823. In 1830, Meigen listed these species and added others.

The genus *Napaea* was established by Robineau-Desvoidy (1830) and two species were described within this genus. The first species was *stagnicola* which included variety A (*Napaea major*) and variety B (*Napaea minor*). From his description, it seems certain that more than one species was involved. Haliday (1839) lists variety A as being synonomous with *Ephydra coarctata* Fallén and B as synonomous with *E. fossarum* Haliday. Since Robineau-Desvoidy's specimens were not preserved, it will never be definitely known what species were actually involved and we can only assume that Haliday was correct in his synonomies. The second species described by Robineau-Desvoidy was *pygmaea* and its identity remains unknown. In 1840, Westwood designated *E. coarctata* as the type-species of the genus *Napaea* as Haliday failed to do so.

Macquart (1835) considered *Napaea* as a synonym of *Ephydra* and Haliday (1839) used it as a subgenus of *Ephydra*. Zetterstedt (1840) made no mention of *Napaea* and placed *aquila* and *coarctata* in *Ephydra*.

In 1944, Stenhammar described *Parydra* as "sectio 3" of *Ephydra* and much later Coquillett (1910) designated *Ephydra aquila* as the type species. Zetterstedt (1846) followed Stenhammar and placed *Parydra* as "sectio 3" of *Ephydra*. *Parydra* was not mentioned by Walker (1853) but he considered *Napaea* as a subgenus of *Ephydra* as did Haliday (1939). Loew (1860 and 1862) used *Parydra* and made no mention of *Napaea*, but apparently he considered it to be a synonym of *Parydra*, and undoubtedly Grünberg (1910) also considered *Napaea* as a synonym though he did not mention it as such.

Hendel (1910) reinstated the older name, *Napaea*. Then Rondani (1914) incorrectly used *Napaea* as a genus based on the type-species, *Ephydra quadrata* Fallén, and used *E. coarctata* as the type-species of *Ephydra*.

In 1918, Cresson regarded *Parydra* as a synonym of *Napaea,* but on the basis of the type-species, he thought both might be distinct at the subgeneric level. Tullgren and Wahlgren (1920-1922), Becker (1926), and Mercier and Tolmer (1928) each placed *Parydra* as a synonym of *Napaea.* Hendel (1930) also considered *Parydra* as a synonym of the older name but spelled it *Parhydra.* By 1930, we find that Cresson was apparently convinced that *Napaea* and *Parydra* were each distinct genera and he described species in both until his death.

Hendel (1931) appears to be the first to discover that Hübner had used *Napaea* as a generic name for a species of Lepidoptera (*Napaea frequens actoris*) in 1819. Hendel thus concluded that *Napaea* was not available as a genus of the family Ephydridae and that *Parydra* Stenhammar would automatically become the correct generic name. Apparently, Hendel (1930 and 1931) discovered that the spelling of *Parydra* by Stenhammar was an error in transliteration of the Greek παρυδρος and believed it should be corrected to *Parhydra.* Cresson (1934 and 1949) did not think the spelling should be corrected, and we find that according to Article 32 of the International Code of Zoological Nomenclature it should not be corrected. Cresson (1934) also maintained that Hübner's use of *Napaea* was not binary or binominal and therefore was not valid. Evidently Cresson's argument was satisfactory and accepted up until 1954, at which time, the International Commission on Zoological Nomenclature in Opinion 276 (Hemming, 1954 and 1958) ruled that the generic and specific names (the first and last names of the trinominal) of Hübner's were acceptable and available. As a result of this ruling *Napaea* is no longer available as a generic name in Ephydridae and *Parydra* Stenhammar becomes the valid name.

Prior to Opinion 276, Séguy (1934) and Duda (1942) both regarded *Parydra* as a synonym of *Napaea.* Cresson (1949) considered both *Napaea* and *Parydra* as valid genera but divided *Napaea* into two subgenera (*Napaea* and *Chaetoapnaea*). Sturtevant and Wheeler (1954) used only *Napaea* and regarded three subgenera (*Napaea, Parydra,* and *Callinapaea*), but they did not recognize *Chaetoapnaea.* Dahl (1959) followed Sturtevant and Wheeler in their classification and apparently was unaware of Opinion 276.

In this paper, the senior author has divided the genus *Parydra* into two subgenera, *Parydra* and *Chaetoapnaea*. The subgenus *Parydra*, as considered here, agrees for the most part with Cresson's genus *Parydra* and Sturtevant and Wheeler's subgenus *Parydra* while the subgenus *Chaetoapnaea*, contained herein, roughly corresponds to Cresson's genus *Napaea* and Sturtevant and Wheeler's subgenus *Napaea*. However the senior author has elected to raise the subgenus *Callinapaea* Sturtevant and Wheeler to the generic level.

Diagnosis. — *Head* when viewed in profile with anterior oral margin extending beyond antennal bases, facial protuberance (carina) near antennal bases and not extending beyond anterior of oral margin; oral margin without setae; arista well-developed and slightly plumose; orbital and occular setae present; parafacial setae present, first pair usually longer than others. *Wings* with costa reaching M_{1+2}; anterior crossvein (r-m) located distinctly beyond the junction of R_1 and costa, and the anterior crossvein intercepting the R_{4+5} at 1/4 or more of the distance from the junction of the R_{4+5} and R_{2+3} to the costa; costal section from R_1 to R_{2+3} 0.6 to 3.3 times the distance from R_{2+3} to R_{4+5}. *Legs* of prothorax not raptorial.

Description. — Shining black flies with golden, coppery, and greyish pruinosity. *Head* when viewed in profile with face straight to concave or convex, anterior oral margin extending beyond antennal bases, facial protuberance (carina) near antennal bases and not extending beyond anterior oral margin; oral margin without setae; ocellar triangle raised; 3 round ocelli; ocellar setae divergent; orbital setae small or large; inner vertical setae convergent; exterior vertical setae divergent. Face shining black; rarely with background luster; usually with dense coppery, golden or silvery pruinosity; 1 or 2 large pairs and several smaller pairs of parafacial setae. Clypeus visible when head is viewed in profile. Antennae with well-developed, slightly plumose arista.

Thorax shining black with golden to coppery pruinosity, becoming greyish on lower areas of pleura; often with greyish stripes laterally along dorsocentral setae, between acrostichal and dorsocentral setae, and medially between acrostichal setal rows; occasionally with white to greyish spot at intrascutal suture; acrostichal and dorsocentral setae small or large, often several pairs of dorsocentrals are larger than others; 1 long pair of prescutellar setae; 2 large pairs of notopleural setae, posterior pair larger; 1 large pair of posterior intraalar setae; mesopleural setae present. Scutellum shining black with golden to coppery pruinosity; 2 well-developed pairs of setae; apical and lateral setae which often have tuberculate bases; apical scutellar process sometimes present but unarmed. *Legs* not raptorial; shining black, reddish, or with reddish parts with golden to greyish pruinosity; apex of prothoracic tibiae with long setae; apex of mesothoracic tibiae variously setose, usually with a spur; apex of metathoracic tibiae variously setose anteriorly but with a pos-

terior comb. *Wing* clear or clouded, usually with darkened areas around crossveins which often are bounded by light spots; costa reaching M_{1+2}; R_{2+3} sometimes appendiculate near apex; anterior crossvein (r-m) located distinctly beyond the junction of R_1 and costa, and anterior crossvein intercepts R_{4+5} at 1/4 or more of the distance from the junction of R_{4+5} and R_{2+3} to the costa; costal section from R_1 to R_{2+3} being 0.6 to 3.3 times the distance from R_{2+3} to R_{4+5}.

Abdomen shining black with golden, coppery or greyish pruinosity. *Male* abdomen with tergites 1 through 5 present, tergite 1 consisting of a dorsal and 2 pleural sclerites, tergites 2 through 5 continuous dorsally or with fine lateral sutures; tergites 6, 7 and 8 absent; tergite 9 fused to short surstyli; sternites 1 through 6 usually present and variously shaped; genites present; gonal arch present or absent; aedeagus often fused to aedeagal apodeme. *Female* abdomen with tergites 1 through 8 present, tergite 1 as in males, tergites 2 through 8 continuous dorsally or with fine lateral sutures; sternites 1 through 8 usually present and variously shaped; genital opening posterior to sternite 8 or between sternites 8 and 9; sternite 9 sometimes present; ventral receptacle mushroom-like in shape.

Key to the Species of the Genus Parydra

1. Face convex when head is viewed in profile (Fig. 1); scutellum usually with tubercules and/or an apical process; male genitalia with aedeagus not fused to aedeagal apodeme, gonites rounded apically, gonal arch usually present 2
   Face straight to concave when head is viewed in profile (Fig. 187); scutellum usually lacking tubercules or an apical process; male genitalia with aedeagus usually fused to aedeagal apodeme, gonites usually pointed apically, gonal arch usually absent. 17
2. Lateral scutellar tubercules present and orbital setae short, 1/3 or less the shortest diameter of the eye 3
   Lateral scutellar tubercules absent and orbital setae long, subequal to 1/2 the shortest diameter of the eye 7
3. Distance between apical scutellar tubercules distinctly greater than their length, katepisternal spine absent 4
   Distance between apical scutellar tubercules less than their length, katepisternal spine present (Fig. 5), male abdomen and genitalia as in Figs. 21 and 87, female abdomen and ventral receptacle as in Figs. 55 and 123 ..... *quadrituberculata* Loew
4. Facial pruinosity golden, white, or sometimes coppery; legs of males without dense posterior flexor row of setae on mesofemur (Fig. 180); female abdomen with sternite 8 lacking posterior notch (Fig. 46); male abdomen and genitalia as in Figs. 12 and 77; female receptacle as in Fig. 114; generally distributed in North America .. *aquila* (Fallén) 5
   Facial pruinosity dark coppery; legs of males with dense posterior flexor row of setae on mesofemur (Fig. 181); female abdomen with sternite

8 deeply notched posteriorly (Fig. 51); male abdomen and genitalia as in Figs. 18 and 83; female ventral receptacle as in Fig. 119; found in western North America ..... *incommoda* Cresson

5. Facial pruinosity golden to coppery, ground color of face black 6
Facial pruinosity white, ground color of face metallic blue ..... subsp. *papulata* Cresson

6. Femora and tibiae black, generally distributed in North America ..... subsp. *aquila* (Fallén)
Femora black except apex reddish and tibiae reddish, found in western North America ..... subsp. *tibialis* Cresson

7. Apical scutellar process present and large 8
Apical scutellar process absent 11

8. Apical scutellar tubercules present and distinct 9
Apical scutellar tubercules absent (Fig. 153); facial pruinosity grey; male abdomen and genitalia as in Figs. 17 and 84; female abdomen and ventral receptacle as in Figs. 53 and 121 ..... *penabbreviata* n. sp.

9. Wings with crossvein joining the R_{2+3} and R_{4+5} near apex of R_{2+3}, R_{2+3}, also appendiculate near apex, female abdomen and ventral receptacle as in Figs. 58 and 126, male unknown .. *vanduzeei* (Cresson)
Wings without crossvein joining R_{2+3} and R_{4+5}, and without appendiculate R_{2+3} 10

10. Tibiae black except for very small areas at base and apex; scutellum with apical process short and broad (Fig. 157), often appearing knobbed; male abdomen and genitalia as in Figs. 23 and 89; female abdomen and ventral receptacle as in Figs. 57 and 125 .. *unituberculata* Loew
Tibiae reddish; scutellum with long, narrow apical process (Fig. 150); male abdomen and genitalia as in Figs. 16 and 82; female abdomen and ventral receptacle as in Figs. 50 and 118 ..... *imitans* Loew

11. Apical scutellar tubercules present, costal section of wing from R_1 to R_{2+3} 0.9 or more times distance from R_{2+3} to R_{4+5} 12
Apical scutellar tubercules absent, costal section of wing from R_1 to R_{2+3} 1.3 or less times distance from R_{2+3} to R_{4+5}, wings as in Fig. 185, male abdomen and genitalia as in Figs. 10 and 76, female abdomen and ventral receptacle as in Figs. 44 and 112 ..... *abbreviata* Loew

12. Apex of scutellum rounded or blunt (as in Figs. 145, 148, 149, 154, or 156) 13
Apex of scutellum distinctly pointed (Fig. 147), male abdomen and genitalia as in Figs. 13 and 79, female abdomen and ventral receptacle as in Figs. 47 and 115 ..... *aurata* Jones

13. Femur black (apex may be reddish), tibiae black or reddish, tarsi reddish 14
Femur, tibiae and tarsi reddish; male abdomen and genitalia as in Figs. 15 and 81; female abdomen and ventral receptacle as in Figs. 49 and 117 ..... *humilis* Williston

14. Tibiae reddish, costal section of wing from R_1 to R_{2+3} 1.6 or less times distance from the R_{2+3} to R_{4+5} 15
Tibiae black, costal section of wing from R_1 to R_{2+3} 2.0 or more times the distance from R_{2+3} to R_{4+5}, male abdomen and genitalia as in Figs. 11 and 78, female abdomen and ventral receptacle as in Figs. 45 and 113 ..... *alpina* (Cresson)
15. Facial pruinosity grey, white, or coppery 16
Facial pruinosity golden or bright coppery, male abdomen and genitalia as in Figs. 14 and 80, female abdomen and ventral receptacle as in Figs. 48 and 116 ..... *breviceps* Loew
16. Facial pruinosity dense grey, white or silvery, with ground color not apparent; eastern North America; male abdomen and genitalia as in Figs. 20 and 86; female abdomen and ventral receptacle as in Figs. 54 and 122 ..... *pinguis* (Walker)
Facial pruinosity sparse grey, white or silvery with metallic ground color very apparent; Florida; male abdomen and genitalia as in Figs. 22 and 88; female abdomen and ventral receptacle as in Figs. 56 and 124 .... *transversa* Cresson
17. Abdomen with 6 visible tergites (Figs. 10 through 40) .... males 18
Abdomen with 8 visible tergites (Figs. 44 through 71) .... females (this portion of the key is difficult and males should be used if available) 39
18. Aedeagus and aedeagal apodeme fused, gonites pointed or rounded apically 22
Aedeagus and aedeagal apodeme not fused, gonites rounded apically .. 19
19. Gonal arch present 20
Gonal arch absent, tergite 9 + surstyli with or without a deep cleft (Figs. 93 and 94), male abdomen and genitalia as in Figs. 27 and 94 .... *borealis* (Cresson)
20. Apical process present on scutellum (Fig. 152), facial pruinosity, grey; male abdomen and genitalia as in Figs. 17 and 84 .. *penabbreviata* n. sp.
Apical process absent on scutellum; facial pruinosity, golden or coppery 21
21. Costal section of wing from R_1 to R_{2+3} 1.5 or more times distance from R_{2+3} to R_{4+5}, wing as in Fig. 195, male abdomen and genitalia as in Figs. 19 and 85 ..... *lynetteae* n. sp.
Costal section of wing from R_1 to R_{2+3} 1.3 or less times distance from R_{2+3} to R_{4+5}, wing as in Fig. 185, male abdomen and genitalia as in Figs. 10 and 76 ..... *abbreviata* Loew
22. Apex of gonites, pointed 26
Apex of gonites, broad, flat and rounded (Figs. 91, 98, and 108) 23
23. Tergite 9 + surstyli acutely angled midventrally (Figs. 29 and 98), aedeagus blunt but with posterior projecting hooks (Fig. 98), male abdomen as in Fig. 29 ..... *hamata* n. sp.

Tergite 9 + surstyli rounded or obtusely angled midventrally (Figs. 25, 26, 40, 91, 92 and 108) 24

24. Aedeagus with apex rounded (Fig. 108) or blunt and forked (Fig. 92), with a large anterior opening, sometimes with a small posterior opening (Fig. 92) 25

Aedeagus with apex hooked, large posterior opening (Fig. 91); male abdomen as in Fig. 25 ..... *appendiculata* Loew

25. Aedeagus with apex rounded, no posterior opening; when viewed from posterior, aedeagus is wide with sides parallel from the base to near apex where they converge abruptly (Fig. 108); male abdomen as in Fig. 40 ..... *vulgaris* Cresson

Aedeagus with apex blunt and forked, small posterior opening present; when viewed from posterior, aedeagus is narrow with sides converging abruptly at base and then slowly converging to apex (Fig. 92); male abdomen as in Fig. 26 ..... *arctica* n. sp.

26. Gonites short, broad, and somewhat hooked at apex (Figs 104 and 106) 27

Gonites long, narrow and usually not hooked 28

27. Tergite 9 + surstyli bearing two large dorsal projections which extend posteriorly beyond cerci (Fig. 106); male abdomen and genitalia as in Figs. 38 and 106 ..... *spinosa* n. sp.

Tergite 9 + surstyli without dorsal projections, male abdomen and genitalia as in Figs. 36 and 104 ..... *quadriloba* n. sp.

28. Anterior-ventral areas of tergites 3, 4 and 5 elongated into finger-like processes (Fig. 33 and 35) 29

Anterior-ventral areas of tergites 3, 4 and 5 not as above but rounded or somewhat angled 30

29. Tip of tergite 9 + surstyli rounded and curving outward from midventral line (Fig. 35); aedeagus, long, broad and dagger-like (Fig. 103) .... *penisica* n. sp.

Tip of tergite 9 + surstyli rounded and curving slightly towards midventral line (Fig. 33); aedeagus, long, narrow, somewhat "S" shaped with rounded hook at tip (Fig. 101) ..... *paullula* Loew

30. Costal section of wing from R_1 to R_{2+3} 0.8 or less times distance from the R_{2+3} to R_{4+5}; aedeagus, long, narrow and pointed (Fig. 90); male abdomen as in Fig. 24 ..... *acuta* n. sp.

Costal section of wing from R_1 to R_{2+3} 1.2 or more times distance from the R_{2+3} to R_{4+5} 31

31. Gonites tapering gradually to apex and not sharply curved at apex .. 32

Gonites tapering abruptly at apex and sharply curved posteriorly at apex (Fig. 92), male abdomen and genitalia as in Figs. 26 and 92 .... *arctica* n. sp.

32. Gonites tapering gradually and evenly from base to apex (as in Fig. 99) 33

Gonites tapering unevenly, taper in basal half more abrupt, distal half thus very long and slender (as in Figs. 100-102) 36

33. Aedeagus broad and flat when viewed from above and having a shallow apical groove (Figs. 31 and 99) ..... *lingulata* n. sp.

Aedeagus narrow when viewed from above and having a deep apical groove (Figs. 95, 96 and 97) 34

34. Aedeagus knife or sheath-like when viewed in profile (Fig. 95), male abdomen as in Fig. 28 ..... *copis* n. sp.

Aedeagus gouge-like when viewed in profile (Figs. 96 and 97). .... *halteralis* (Cresson) 35

35. Aedeagus slender and uniformly shaped in apical one-third (Fig. 96) .... n. subsp. *joaquinensis*

Aedeagus slender but thickened in apical one-third (Fig. 97). .... subsp. *halteralis* (Cresson)

36. Aedeagus curved and slightly hooked at apex (Figs. 102 and 107) .. 37

Aedeagus not curved or hooked at apex (Figs. 100 and 105) 38

37. Aedeagus with sclerotized bridge dividing open posterior (Fig. 102), male abdomen as in Fig. 34 ..... *pedalis* n. sp.

Aedeagus without sclerotized bridge dividing open posterior (Fig. 107), male abdomen as in Fig. 39 ..... *succurva* n. sp.

38. Aedeagus with a large, flat, keeled apex (Fig. 100); metatibiae each with 1 or 2 very large spines on anteroventral apex, one of which extends far beyond apex of tibia (Fig. 183), male abdomen as in Fig. 32 .... *parasocia* n. sp.

Aedeagus with apex somewhat rounded to blunt (Fig. 105); metatibiae each with several small spines on anteroventral apex which extend at most only slightly beyond apex of tibia (Fig. 182), male abdomen as in Fig. 37 ..... *socia* (Cresson)

39. Abdomen with eighth sternite consisting of a large median sclerite and one small lateral sclerite on each side (Figs. 63, 64, 66, and 67) 40

Abdomen with eighth sternite consisting of only a large median sclerite or of only 2 small lateral sclerites 44

40. Costal section of wing from R_1 to R_{2+3} 1.3 or less times distance from R_{2+3} to R_{4+5}, abdomen and ventral receptacle as in Figs. 66 and 134 ..... *paullula* Loew

Costal section of wing from R_1 to R_{2+3} 1.6 or more times distance from R_{2+3} to R_{4+5} 41

41. Sternite 8 with median sclerite distinctly triangular and lateral sclerites comma-shaped, abdomen and ventral receptacles as in Figs. 67 and 135 ..... *penisica* n. sp.

Sternite 8 with median sclerite subtrapezoidal, not triangular, and lateral sclerites oval (Figs. 63 and 64) 42

42. Ventral receptacle large, total length of abdomen about 9 times length of cap of ventral receptacle; abdomen and ventral receptacle as in Figs. 63 and 130 (females can be separated to subspecies only on basis of

locality data) *halteralis* Cresson 43

Ventral receptacle small, total length of abdomen about 14 times length of cap of ventral receptacle; abdomen and ventral receptable as in Figs. 64 and 132 ..... *lingulata* n. sp.

43. From San Joaquin Valley of California ..... n. subsp. *joaquinensis*

Not from San Joaquin Valley ..... subsp. *halteralis* (Cresson)

44. Sternite 8 with a deep, narrow, posterior notch (Figs. 52 and 53) 45

Sternite 8 without a posterior notch 46

45. Sternite 7 without an anterior notch (Fig. 52), ventral receptacle with a very large cap which covers all but apex of receptacle (Fig. 120) .... *lynetteae* n. sp.

Sternite 7 with a large anterior notch (Fig. 53); ventral receptacle cap smaller, covering only about 2/3 of receptacle (Fig. 121) .... *penabbreviata* n. sp.

46. Costal section of wing from R_1 to R_{2+3} 1.1 or less times distance from R_{2+3} to R_{4+5}, sternite 8 divided into 2 lateral fragments (Fig. 44), ventral receptacle as in Fig. 112 ..... *abbreviata* Loew

Costal section of wing from R_1 to R_{2+3} 1.1 or more times distance from R_{2+3} to R_{4+5}, sternite 8 seldom divided into 2 lateral fragments .. 47

47. Sternite 8 much wider than sternites 6 or 7 and broadly concave anteriorly with a blunt posterior (Fig. 60) or divided medially to form two lateral fragments (Fig. 71) 48

Sternite 8 usually subequal or narrower than sternites 6 or 7 and blunt to convex anteriorly, usually with slight concavity on posterior lateral margins of each side (Figs. 59, 61, 62, 65, 69 and 70); if wider than other sternites then with an anterior "V" notch and a rounded posterior (Fig. 68) 49

48. Ventral receptacle with cap about 1/2 total length of receptacle (Fig. 128), sternite 8 not divided (Fig. 60) ..... *arctica* n sp.

Ventral receptacle with cap about 2/3 total length of receptacle (Fig. 139), sternite 8 often divided into 2 lateral fragments (Fig. 71) .... *vulgaris* Cresson

49. Sternite 8 subequal or narrower than sternites 6 or 7 and blunt to convex anteriorly, usually with a slight concavity on posterior lateral margins of each side (Figs. 59, 61, 62, 65, 69 and 70) 50

Sternite 8 wider than sternites 6 or 7 and with an anterior "V" notch and rounded posterior (Fig. 68); ventral receptacle as in Fig. 136 .... *quadriloba* n. sp.

50. Sternites 6, 7 and 8 much wider than other sternites (Fig. 70); ventral receptacle as in Fig. 138 ..... *succurva* n. sp.

Sternites 6, 7 and 8 subequal in width to other sternites 51

51. Costal section of wing from R_1 to R_{2+3} 1.7 or less times distance from R_{2+3} to R_{4+5} 52

Costal section of wing from R_1 to R_{2+3} 1.9 more times distance from

R_{2+3} to R_{4+5}, abdomen and ventral receptacle as in Figs. 62 and 131 ..... *hamata* n. sp.

52. Sternite 5 round to oval (Fig. 59), ventral receptacle usually with top of cap narrow and appearing somewhat pointed (Fig. 127), R_{2+3} usually appendiculate near tip (Fig. 202) ..... *appendiculata* Loew

Sternite 5 not round or oval, subtriangular with an anterior notch or round with an anterior projection (Figs. 61, 65 and 69); ventral receptacle with top of cap rounded, not narrow and appearing somewhat pointed (Figs. 129, 133 and 137); R_{2+3} with or without appendiculate tip 53

53. Ventral receptacle with internal fold of cap not constricted near top, cap about 2/3 length of receptacle, ventral receptacle as in Fig. 129, female abdomen as in Fig. 61. ..... *borealis* (Cresson)

Ventral receptacle with internal fold of cap constricted near top, cap about 3/4 length of receptacle, ventral receptacle as in Figs. 133 and 137 54

54. Metatibiae each with one very large spine on anteroventral apex which extends far beyond apex of tibia, female abdomen and ventral receptacle as in Figs. 65 and 133 ..... *parasocia* n. sp.

Metatibiae each with several small spines on anteroventral apex which extend at most only slightly beyond apex of tibia, female abdomen and ventral receptacle as in Figs. 69 and 137 ..... *socia* (Cresson)

Subgenus Parydra Stenhammar

See generic synonomies.

Diagnosis. — Face convex when head is viewed in profile; head setae small or large; scutellum usually with tubercules and/or an apical process; male genitalia with aedeagus not fused to aedeagal apodeme, gonites rounded apically, gonal arch usually present.

Description. — Generally large (1.87 to 5.47 mm long), shining black flies with golden, coppery and greyish pruinosity. *Head* with ocellar triangle raised; ocellar setae small or large, divergent; interocellar and postocellar setae small, divergent; orbital setae small or large; eyes red, oval; 1 large or small pair of convergent inner vertical setae; 1 large or small pair of divergent, exterior vertical setae; postorbitals and occipitals small. Face convex when viewed in profile; shining black with golden, coppery, greyish, or silvery pruinosity; facial depressions small to large and long, from antennal base to first parafacial seta; 1 or 2 large pairs and several smaller pairs of parafacial setae.

Thorax shining black with golden to coppery pruinosity, becoming greyish on lower areas of pleura; often with greyish stripes laterally along dorsocentral setal rows, between acrostichal and dorsocentral setal rows, and medially between acrostichal setal rows; occasionally with white to greyish spot at intrascutal suture; acrostichal and dorsocentral setae small or large, often several pairs of dorsocentrals are larger than others; 1 long pair of prescutellar setae; 2 large pairs of notopleural setae, posterior pair larger; 1 large pair of

posterior intraalar setae; 1 large pair of mesopleural setae; sternum with greyish pruinosity; katepisternal spine usually absent. Scutellum shining black with golden to coppery pruinosity; apical process present or absent; apical tubercules usually present; lateral tubercules often present; apical and lateral scutellar setae present and large. *Legs* black, partly black with greyish pruinosity; apex of prothoracic tibiae with long setae; apex of mesothoracic tibiae variously setose, usually with a spur; apex of metathoracic tibiae variously setose anteriorly but with yellow comb posteriorly. *Wing* clear to clouded, usually with darkened areas around crossveins which may be bounded by light or white spots; R_{2+3} usually not appendiculate near apex.

Abdomen as in generic description except as follows: Male genitalia with aedeagus not fused to aedeagal apodeme; gonites rounded apically; and gonal arch often present.

Parydra (Parydra) abbreviata Loew

Parydra abbreviata Loew, 1861:357; Loew 1861:51; Loew 1862:168; Loew 1864?:51.
Napaea (*Chaetoapnaea*) *abbreviata* (Loew), Cresson 1949:236.
Napaea hulli Cresson, 1934:212.
Napaea (*Chaetoapnaea*) *hulli* Cresson, 1949:236.
Napaea (*Napaea*) *abbreviata* (Loew), Sturtevant and Wheeler 1954: 221-222.

Type. — This species was described from a single, male specimen (type 11166) bearing the labels, Penn. and Loew Collection. This is deposited in the Museum of Comparative Zoology, Harvard.

Diagnosis. — Lateral scutellar tubercules and apical scutellar tubercules absent, apical scutellar process absent, orbital setae long, face convex to concave when viewed in profile, and costal section of wing from R_1 to R_{2+3} 1.3 or less times distance from R_{2+3} to R_{4+5}.

Description: *MALE.* — Total body length 1.87 to 2.79 mm; shining black with coppery and greyish pruinosity. *Head* shining black with coppery pruinosity except where noted; length 0.48 to 0.58 mm; ocellar triangle raised; 3 round ocelli; ocellar setae large, divergent; interocellar and postocellar setae small, divergent; 2 large pairs of orbital setae; eyes red, oval; vertex with coppery pruinosity above, becoming golden below; 1 large pair of convergent, inner vertical setae; 1 large pair of divergent, exterior vertical setae; postorbitals and occipitals very small; gena black with golden or dull coppery pruinosity. Face shining black with dull, coppery pruinosity; convex when viewed in profile; facial depressions long, from antennal base to first parafacial seta; 1 large pair and 3 to 5 smaller pairs of parafacial setae. Clypeus with dull, coppery pruinosity; mouthparts with grey pruinosity. Antennae dark, brown to black with coppery pruinosity; arista black, plumose.

Thorax shining black with golden to coppery, pruinosity; faint, greyish spots at intrascutal suture; faint greyish stripes laterally along dorsocentral

setae, between dorsocentral and acrostichal setal rows, and medially between acrostichal setal rows; scutum length 0.58 to 0.71 mm; many long acrostichal setae; many long dorsocentral setae with 3 pairs being larger than others, 1 pair at intrascutal suture and 2 pairs farther posterior; 1 long pair of prescutellar setae; humeral and posthumeral setae long and fine; presuturals long and fine, 1 larger pair; 2 large pairs of notopleurals, posterior pair larger; 1 large pair of posterior intraalar setae; pleura shining black with dull coppery pruinosity above, becoming greyish below, 1 large pair of mesopleural setae; sternum with greyish pruinosity; katepisternal spine absent. Scutellum (Fig. 144) shining black with dull coppery to golden pruinosity, length 0.24 to 0.31 mm, apical process absent, apical tubercules present, apical scutellar setae large, lateral tubercules absent, lateral scutellar setae large. *Legs* black except tibiae, tarsi, trochanters and apex of femurs reddish; legs covered with greyish pruinosity; prothoracic tibiae with long yellow setae at apex; mesothoracic tibiae each with a spur and 3 large, black anterior setae; apex of metathoracic tibiae with an anterior cluster of black setae and a reddish, posterior comb. *Wing* (Fig. 185) clouded, darkened areas around crossveins bounded by clear to whitish spots, one whitish spot posterior to medial crossvein and one spot near middle of M_{1+2}; veins brown; length from humeral crossvein 1.43 to 1.80 mm; width 0.71 to 0.82 mm; distance from h to R_1 0.41 to 0.51 mm; R_1 to R_{2+3} 0.41 to 0.54 mm; R_{2+3} to R_{4+5} 0.56 to 0.68 mm; R_{4+5} to M_{1+2} 0.24 to 0.27 mm; length of R_{4+5} 0.78 to 0.99 mm; length of M_{1+2} 0.41 to 0.48 mm; costal section from R_1 to R_{2+3} 0.6 to 1.1 times distance from R_{2+3} to R_{4+5}; halteres yellow to light brown.

Abdomen as in Fig. 10 except where noted; shining black with coppery pruinosity anteriorly and medially, becoming greyish posteriorly and laterally on tergites. Tergites 2 through 5 continuous dorsally or with fine lateral sutures; tergites 6, 7 and 8 absent. Sternite 2 variable, broad U-shaped, anterior notch with narrower, blunt posterior, sometimes subcordate with or without a lateral constriction; sternite 4 round or elongate oval. *Genitalia* as in Fig. 76. Note the paired gonites with long, narrow, rounded apices, fused to sternite 5 anteriorly, connected to gonal arch posteriorly. Gonal arch narrow with long, narrow, medial projection connecting with aedeagus. Aedeagus boat-shaped, not fused to aedeagal apodeme.

FEMALE. — Total body length 2.31 to 3.03 mm. Head, thorax, legs and wings as in males except where mentioned.

Head length 0.54 to 0.71 mm; parafacial setae, 1 large pair and 3 or 4 smaller pairs.

Thorax with scutum length 0.68 to 0.78 mm; scutellum length 0.27 to 0.44 mm. *Wing* length from humeral crossvein 1.56 to 2.11 mm; width 0.78 to 1.02 mm; distance from h to R_1 0.41 to 0.61 mm; R_1 to R_{2+3} 0.48 to 0.75 mm; R_{2+3} to R_{4+5} 0.58 to 0.75 mm; R_{4+5} to M_{1+2} 0.24 to 0.34 mm; length of R_{4+5} 0.82 to 1.22 mm; length of M_{1+2} 0.44 to 0.58 mm; costal section from R_1 to R_{2+3} 0.8 to 1.3 times distance from R_{2+3} to R_{4+5}.

Abdomen as in Fig. 44 except where mentioned. Tergites 3 through 6 sometimes with small, anterior fragments. Sternite 2 with shallow, broad, V-shaped or sometimes deep V-shaped anterior notch with narrower, truncate posterior; sternites 3 through 6 elongate oval or elliptical, sometimes with anterior fragments and small anterior or posterior notches; sternite 7 sometimes with anterior fragments and small anterior or posterior notches; sternite 8 usually divided into two lateral fragments but sometimes continuous. Ventral receptacle as in Fig. 112.

Distribution. — Eastern and Southeastern United States (Fig. 228).

Specimens examined. — 23 specimens (14 ♂♂ and 9 ♀♀) with the following data: Pennsylvania, holotype ♂; Agawam, Massachusetts, April 20, 1916, H. E. Smith, 1 ♂ and 2 ♀♀; same as previous data but April 21, 1916, 2 ♀♀; W. Springfield, Massachusetts, April 6, 1916, H. E. Smith, 1 ♀; same data as previous but April 7, 1916, 1 ♀; Cranberry Glades, Pocahontas Co., West Virginia, July 16, 1955, C. W. Sabrosky, 1 ♂; Mount Vernon, Virginia, April 19, 1917, W. L. McAtee, 1 ♂; Great Falls, Virginia, June 21, 1913, A. L. Melander, 1 ♀; D.C., Loew, 1 ♂ and 1 ♀; Mosquito Cr., on Ga. Hwy. 97, Decatur Co., Georgia, March 20, 1954, George Steyskal, 1 ♂; Agriculture College, Mississippi, Aug. 18, 1922, 1 ♂; Torreya State Park, Liberty Co., Florida, March 23, 1954, George Steyskal, 5 ♂♂; same as previous except Sweetwater Creek near old "Camp Torreya", 2 ♂♂.

Parydra (Parydra) alpina (Cresson)

Napaea alpina Cresson 1924:163.
Parydra alpina (Cresson) 1949:247.
Napaea (*Napaea*) *alpina* Cresson, Sturtevant and Wheeler 1954:222.

Types. — Holotype ♂ and allotype, Longmire's Springs, Mt. Rainier, Washington, Aug. 2, 1905. The holotype and allotype are deposited in the Academy of Natural Sciences of Philadelphia.

Diagnosis. — Lateral scutellar tubercules absent, apical scutellar tubercules present, apical scutellar process absent, orbital setae long, tibiae black, and the costal section of wing from R_1 to R_{2+3} 2.0 or more times distance from R_{2+3} to R_{4+5}.

Description: *MALE.* — Total body length 3.57 to 4.08 mm; shining black with golden, coppery and greyish pruinosity. *Head* shining black with coppery pruinosity except as stated; length 0.71 to 0.88 mm; ocellar triangle

raised; 3 round ocelli; ocellar setae large, divergent; interocellar and postocellar setae small, divergent; 2 or 3 large pairs and occasionally 1 small pair of orbital setae; eyes red, oval; vertex with coppery pruinosity above, becoming golden below; 1 large pair of convergent, inner vertical setae; 1 large pair of divergent, exterior vertical setae; postorbitals and occipitals very small; gena black with golden or coppery pruinosity. Face shining black with grey or silvery pruinosity; convex when viewed in profile; facial depressions small, not reaching first parafacial setae. Clypeus with silvery pruinosity. Antennae dark, brown to black with coppery pruinosity; arista black, plumose.

Thorax shining black with coppery pruinosity; no greyish spots at intrascutal suture; faint greyish stripes between dorsocentral and arostichal setal rows; scutum length 0.95 to 1.12 mm; many long arostichal setae; many long dorsocentral setae, 1 longer pair at intrascutal suture; 1 long pair of prescutellar setae; humeral and posthumeral setae short and fine; presuturals long and fine, 1 larger pair; 2 large pairs of notopleurals, posterior pair larger; 1 large pair of posterior intraalar setae; pleura shining black with golden to coppery pruinosity above, becoming greyish below; 1 large pair of mesopleural setae; sternum with greyish pruinosity; katepisternal spine absent. Scutellum (Fig. 145) shining black with coppery pruinosity, length 0.41 to 0.48 mm, apical process absent, apical tubercules present, apical scutellar setae large, lateral tubercules absent, lateral scutellar setae large. *Legs* black except trochanters and tarsi reddish; legs covered with greyish pruinosity; prothoracic tibiae with long yellow setae at apex; mesothoracic tibiae each with a spur and 3 large, black anterior setae; apex of metathoracic tibiae each with 1 large and 1 smaller anterior setae and a yellow, posterior comb. *Wing* (Fig. 186) clouded, darkened areas around crossveins bounded by clear to whitish spots; no spots posterior to medial crossvein or near middle of M_{1+2}; veins brown; length from humeral crossvein 2.55 to 3.03 mm; width 1.16 to 1.29 mm; distance from h to R_1 0.68 to 0.88 mm; R_1 to R_{2+3} 1.29 to 1.53 mm; R_{2+3} to R_{4+5} 0.65 to 0.68 mm; R_{4+5} to M_{1+2} 0.31 to 0.34 mm; length R_{4+5} 1.63 to 1.80 mm; length M_{1+2} 0.99 to 1.09 mm; costal section from R_1 to R_{2+3} 2.0 to 2.2 times distance from R_{2+3} to R_{4+5}; halteres yellow.

Abdomen as in Fig. 11 except where noted; shining black with greyish and coppery pruinosity. Tergites 2 through 5 continuous dorsally or with fine lateral sutures; tergites 6, 7 and 8 absent. Sternite 2 variable, cordate with rounded or V-shaped anterior notch; sternite 3 elongate oval, with or without an anterior fragment; sternite 4 oval, with or without a projection and/or a posterior notch; sternite 5 rounded anteriorly, wider and truncate posteriorly, may have 1 to many strongly sclerotized areas appearing like fragments. *Genitalia* as in Fig. 78. Note the tergite 9 + surstyli with somewhat curved, pointed apices. Paired gonites with long, narrow, rounded apices, fused to sternite 6 anteriorly; gonal arch not complete. Aedeagus boat-shaped, not fused to aedeagal apodeme.

FEMALE. — Total body length 4.08 to 4.45 mm. Head, thorax, legs, and wings as in males except where indicated.

Head length 0.88 to 0.95 mm; parafacial setae, 1 large pair and 3 to 5 smaller pairs.

Thorax with scutum length 1.19 to 1.33 mm; scutellum length 0.44 to 0.54 mm. *Wing* length from humeral crossvein 3.06 to 3.50 mm; width 1.26 to 1.53 mm; distance from h to R_1 0.82 to 0.99 mm; R_1 to R_{2+3} 1.56 to 1.80 mm; R_{2+3} to R_{4+5} 0.68 to 0.75 mm; R_{4+5} to M_{1+2} 1.12 to 1.26 mm; costal section from R_1 to R_{2+3} 2.1 to 2.3 times distance from R_{2+3} to R_{4+5}.

Abdomen as in Fig. 45 except where noted. Sternite 3 sometimes with notched anterior; sternite 4 oval, oval with straight sides, or oval with small anterior projection; sternite 5 rounded anteriorly with or without a projection, wider and truncate to blunt posteriorly. Tergites 5 and 6 sometimes lacking anterior fragments. Ventral receptacle as in Fig. 113.

Distribution. — Northern United States and Southern Canada from the Atlantic to the Pacific Oceans (Fig. 232).

Specimens examined. — 74 specimens (32 ♂♂ and 42 ♀♀) from Colorado, Massachusetts, Michigan, Minnesota, Nebraska, New Hampshire, Oregon, Washington, Wisconsin, Wyoming, Alberta, Labrador, Manitoba, Ontario, and Quebec. Collected from March through October.

Parydra (Parydra) aquila (Fallén)

Synonomies listed under each subspecies.

Parydra aquila is the most common species of the genus and is undoubtedly found throughout most of the northern hemisphere, north of latitude 30 degrees. *Parydra aquila* was described as the Palearctic species while the Nearctic *aquila,* as the senior author considers it, was divided into a number of species. Loew (1862) described *P. bituberculata,* and later Cresson (1915, 1916, and 1949) described *P. nitida, tibialis,* and *papulata.* A detailed examination of the types and many specimens of these species has convinced the senior author that they are all conspecific with *Parydra aquila.*

Sturtevant and Wheeler (1954) indicated that their examination of specimens of *P. aquila* from various European localities suggested that *P. aquila* and *P. bituberculata* were of the same aggregate species. However, they did not make the synonomy. The senior author has examined Fallén's type series (3 ♀♀) of *P. aquila,* designated a lectotype, and believes *bituberculata* and *aquila* to be synonomous.

Also, the senior author is convinced that *P. nitida* is synonomous with *bituberculata* and *aquila.* This synonomy was suggested by

Cresson (1949) where he discovered the difficulty in separating *nitida* and *bituberculata* and mentioned the improbability that *nitida* was a distinct species. Sturtevant and Wheeler (1954) discussed this but retained *nitida* as a subspecies of *bituberculata*. However, there appears to be reason to retain *nitida* as even a subspecies since there are no morphological differences nor any geographical separation.

Sturtevant and Wheeler (1954) placed *papulata* as a subspecies of *bituberculata* and with this the senior author will agree. However, they retained *P. tibialis* as a distinct species but similar to *P. bituberculata*. After detailed genitalic examinations of the types and many specimens, the senior author is sure that *P. tibialis* and *P. papulata* are also *P. aquila*. Since *tibialis* and *papulata* can both be separated by distinct color differences and both have more restricted distributions than the remaining *aquila*, these are to be retained as subspecies of *aquila*.

Diagnosis. — Lateral scutellar tubercules present; apical scutellar tubercules present and distance between them distinctly greater than their length; apical scutellar process absent; orbital setae short; facial pruinosity white, golden or sometimes coppery; katepisternal spine absent; legs of males without a dense posterior flexor row of setae on the mesofemur; and females with sternite 8 lacking a deep posterior notch.

Description: *MALE.* — Total body length 3.77 to 5.44 mm; shining black with golden, coppery, white and greyish pruinosity. *Head* shining black with golden to coppery pruinosity except where specified; length 0.85 to 1.12 mm; ocellar triangle raised; 3 round ocelli; ocellar, interocellar, and postocellar setae small, divergent; orbital setae small but 2 or 3 pair larger than others, 2 to 6 smaller pairs; eyes red, oval; vertex with coppery pruinosity above, becoming golden below and laterally, whitish centrally; 1 small pair of convergent, inner vertical setae; 1 small pair of divergent, exterior vertical setae; postorbitals and occipitals very small; gena black with golden pruinosity. Face shining black with golden to coppery pruinosity or metallic blue with white pruinosity; convex when viewed in profile; facial depressions long, from antennal base to first parafacial setae; 1 large pair and 3 to 10 smaller pairs of parafacial setae. Clypeus with white, coppery or golden pruinosity; mouthparts with grey pruinosity; arista black, slightly plumose.

Thorax shining black with golden to coppery pruinosity; no greyish spots at intrascutal suture; faint greyish stripes between dorsocentral and acrostichal setal rows; scutum length 1.16 to 1.53 mm; many short acrostichal and dorsocentral setae; 1 long pair of prescutellar setae; humeral, posthumeral and presutural setae small and fine; 2 large pairs of notopleurals, posterior pair larger; 1 large pair of posterior intraalar setae; pleura shining black with golden

pruinosity above and anteriorly, becoming greyish below and posteriorly; 1 large pair of mesopleural setae; sternum with greyish pruinosity; katepisternal spine absent. Scutellum (Fig. 146) shining black with golden to coppery pruinosity, length 0.44 to 0.61 mm, apical process absent, apical tubercles present but distance between them being distinctly greater than their length, apical scutellar setae large, lateral tubercules present, lateral scutellar setae large. *Legs* black except reddish tarsi or black except apex of femora, tibiae and tarsi reddish; legs covered with greyish pruinosity; prothoracic tibiae with long yellow setae at apex; mesothoracic tibiae each with a spur and 3 large, black anterior setae; apex of metathoracic tibiae with an anterior cluster of black setae and a yellow, posterior comb. *Wing* (Figs. 187-189) almost clear, slightly darkened around crossveins, not bounded by whitish spots, no spot posterior to medial crossvein or near middle of M_{1+2}; veins brown; length from humeral crossvein 2.89 to 3.88 mm; width 1.22 to 1.67 mm; distance from h to R_1 0.92 to 1.09 mm; R_1 to R_{2+3} 1.53 to 2.11 mm; R_{2+3} to R_{4+5} 0.54 to 0.78 mm; R_{4+5} to M_{1+2} 0.31 to 0.41 mm; length of R_{4+5} 1.80 to 2.45 mm; length M_{1+2} 1.16 to 1.56 mm; costal section from R_1 to R_{2+3} 2.1 to 3.3 times distance from R_{2+3} to R_{4+5}; halteres yellow.

Abdomen as in Fig. 12 except where indicated; shining black with golden pruinosity. Tergites 2 through 5 continuous dorsally or with fine lateral sutures; tergites 6, 7 and 8 absent. Sternites 2 through 5 somewhat variable in shape but similar to those of Fig. 12, anterior fragments present or absent. *Genitalia* as in Fig. 77. Note the paired triangular gonites with rounded apices, fused to sternite 6 anteriorly, connected to gonal arch posteriorly. Gonal arch usually complete, narrow, with triangular medial fragment. Aedeagus boat-shaped, not fused to aedeagal apodeme.

FEMALE. — Total body length 4.42 to 5.47 mm. Head, thorax, legs and wings as in males except where indicated.

Head length 0.88 to 1.12 mm; parafacial setae, 1 large pair and 4 to 11 smaller pairs.

Thorax with scutum length 1.26 to 1.60 mm; scutellum length 0.51 to 1.02 mm. *Wing* length from humeral crossvein 3.30 to 4.11 mm; width 1.33 to 1.84 mm; distance from h to R_1 0.99 to 1.26 mm; R_1 to R_{2+3} 1.77 to 2.24 mm; R_{2+3} to R_{4+5} 0.61 to 0.82 mm; R_{4+5} to M_{1+2} 0.31 to 0.41 mm; length R_{4+5} 2.04 to 2.55 mm; length M_{1+2} 1.29 to 1.60 mm; costal section from R_1 to R_{2+3} being 2.5 to 3.2 times the distance from R_{2+3} to R_{4+5}.

Abdomen as in Fig. 46 except where mentioned. Sternites 2 through 8 somewhat variable but usually very similar to those in Fig. 46, may be with or without anterior fragments on sternites 2 through 4. Ventral receptacle as in Fig. 114.

Distribution. — Northern North America, and probably Europe and Asia, above latitude 30 degrees North.

Parydra (Parydra) aquila aquila (Fallén)

Ephydra aquila Fallén 1813:247; Fallén 1823:4; Macquart 1835:537; Meigen 1830:117-118; Zetterstedt 1840:716; Zetterstedt 1846:1819-1820.

Parydra aquila (Fallén), Stenhammar 1844:187-188; Loew 1860:32; Schiner 1864:259; Becker 1896:211-212; Grünberg 1910:293; Cresson 1930: 105-106.

Napaea aquila (Fallén), Haliday 1839:407; Becker 1926:99-100; Séguy 1934: 442; Tullgren and Wahlgren 1920-1922:542.

Napaea (*Parydra*) *aquila* (Fallén), Dahl 1959:131.

Parydra bituberculata Loew, 1862:165; Cresson 1949:245-246.

Parydra nitida Cresson, 1915:70; Cresson 1949:246.

Napaea (*Parydra*) *bituberculata bituberculata* (Loew), Sturtevant and Wheeler 1954:227; Dahl 1961:39.

Napaea (*Parydra*) *bituberculata nitida* (Cresson), Sturtevant and Wheeler 1954:227-228.

Types. — Fallén's type series is composed of 3 female specimens deposited in the Naturhistoriska Riksmuseum in Stockholm, Sweden. The senior author has designated one specimen as the lectotype and the remaining two as paralectotypes. The specimens bore no locality or collection date. The lectotype bore the label 416-68, Riksmuseum Stockholm and the paralectotypes 417-68 and 418-68, Riksmuseum Stockholm. The lectotype also was labeled *E. aquila* ♂ (actually ♀), one paralectotype (417-68) was labeled *E. aquila* ♀ and the other paralectotype had no determination label.

Diagnosis. — This subspecies can be distinguished from the other subspecies of *aquila* by the presence of golden to coppery facial pruinosity and black tibiae.

Description: *MALE.* — As in the species description except total body length 3.81 to 5.20 mm.

Head length 0.85 to 1.12 mm. Face shining black with golden to coppery pruinosity.

Thorax with scutum length 1.16 to 1.43 mm; scutellum length 0.51 to 0.61 mm. *Legs* black except tarsi reddish. *Wing* (Fig. 187) length from humeral crossvein 3.23 to 3.74 mm; width 1.33 to 1.63 mm; distance from h to R_1 0.92 to 1.02 mm; R_1 to R_{2+3} 1.67 to 2.07 mm; R_{2+3} to R_{4+5} 0.54 to 0.78 mm; R_{4+5} to M_{1+2} 0.34 to 0.41 mm; length R_{4+5} 1.94 to 2.24 mm; length M_{1+2} 1.19 to 1.43 mm; costal section from R_1 to R_{2+3} 2.1 to 3.3 times distance from R_{2+3} to R_{4+5}.

FEMALE. — Total body length 3.54 to 4.96 mm; remainder as in males except where noted.

Head length 0.88 to 1.12 mm.

Thorax with scutum length 1.26 to 1.50 mm; scutellum length 0.51 to 0.68 mm. *Wing* length from humeral crossvein 3.53 to 3.91 mm; width 1.39 to 1.70 mm; distance from h to R_1 0.99 to 1.09 mm; R_1 to R_{2+3} 1.87 to 2.11 mm; R_{2+3} to R_{4+5} 0.68 to 0.82 mm; R_{4+5} to M_{1+2} 0.34 to 0.41 mm; length R_{4+5} 2.14 to 2.45 mm; length M_{1+2} 1.33 to 1.50 mm; costal section from R_1 to R_{2+3} 2.5 to 2.8 times distance from R_{2+3} to R_{4+5}

Distribution. — Northern North America, Europe, and perhaps Asia, above latitude 30 degrees North (Fig. 223).

Specimens examined. — 2,346 specimens (991 ♂♂ and 1,355 ♀♀) from Arizona, California, Colorado, Connecticut, D.C., Idaho, Illinois, Indiana, Iowa, Kansas, Kentucky, Maryland, Massachusetts, Michigan, Minnesota, Missouri, Montana, Nebraska, Nevada, New Hampshire, New Jersey, New Mexico, New York, North Carolina, North Dakota, Ohio, Oregon, Pennsylvania, South Dakota, Tennessee, Vermont, Virginia, Washington, West Virginia, Wisconsin, Wyoming, Alberta, British Columbia, Labrador, Manitoba, New Brunswick, Nova Scotia, Ontario, Quebec, and Saskatchewan. In addition, the senior author has examined Fallén's types from Europe, 1 ♂ and 1 ♀ probably from another European locality, and 1 ♀ from Austria. This subspecies is collected from March through December.

Parydra (Parydra) aquila papulata (Cresson)

Parydra papulata Cresson, 1949:247.
Napaea (*Parydra*) *bituberculata papulata* (Cresson), Sturtevant and Wheeler 1954:228.

Types. — Holotype ♂, allotype, 2 male paratypes, and 2 female paratypes from Friday Harbor, Washington. The holotype, allotype, and two paratypes (1 ♂ and 1 ♀) lack a collection date. A male paratype was collected July 6.05 and a female paratype was collected 7.23.05. No collector was indicated on any of the types. The holotype and allotype are deposited in the Academy of Natural Sciences of Philadelphia, and the paratypes are deposited in the U.S. National Museum.

Diagnosis. — Distinguishable from the other subspecies of *aquila* by the presence of a face with white pruinosity and black tibiae.

Description: *MALE.* — As in the species description except total body length 4.45 to 5.44 mm.

Head length 1.02 mm. Face shining metallic blue with white pruinosity.

Thorax with scutum length 1.43 to 1.53 mm; scutellum length 0.54 to 0.61 mm. *Legs* black except tarsi reddish. *Wing* (Fig. 188) length from humeral crossvein 3.57 to 3.88 mm; width 1.53 to 1.67 mm; distance from h to R_1 1.02 to 1.09 mm; R_1 to R_{2+3} 1.94 to 2.11 mm; R_{2+3} to R_{4+5} 0.68 to 0.75 mm; R_{4+5} to M_{1+2} 0.37 to 0.41 mm; length R_{4+5} 2.21 to 2.45 mm; length M_{1+2} 1.36 to 1.56 mm; costal section from R_1 to R_{2+3} 2.6 to 3.0 times distance from R_{2+3} to R_{4+5}.

FEMALE. — Total body length 4.69 to 5.47 mm; remainder as in males except where specified.

Head length 1.02 to 1.09 mm.

Thorax with scutum length 1.43 to 1.60 mm; scutellum length 0.58 to 1.02 mm. *Wing* length from humeral crossvein 3.94 to 4.11 mm; width 1.63 to 1.77 mm; distance from h to R_1 1.09 to 1.26 mm; R_1 to R_{2+3} 2.18 to 2.24 mm; R_{2+3} to R_{4+5} 0.68 to 0.81 mm; R_{4+5} to M_{1+2} 0.37 to 0.41 mm; length R_{4+5} 2.45 to 2.55 mm; length M_{1+2} 1.53 to 1.60 mm; costal section from R_1 to R_{2+3} 2.8 to 3.2 times distance from R_{2+3} to R_{4+5}.

Distribution. — Northwestern U.S. and Southwestern Canada (Fig. 224).

Specimens examined. — 114 specimens (45 ♂♂ and 69 ♀♀) from Oregon, Washington, 1 specimen from Wyoming at 6,500′, and British Columbia. Collected June through August.

Parydra (Parydra) aquila tibialis (Cresson)

Parydra tibialis Cresson, 1916:150; Cresson 1949:248-249.
Napaea (*Parydra*) *tibialis* (Cresson), Sturtevant and Wheeler 1954:229.

Types. — Holotype ♂, 3 ♂ and 5 ♀ paratypes from Oak Creek Canon [sic!], Arizona, 6,000′, Aug. F. H. Snow. The holotype is deposited at the University of Kansas. Two paratypes (1 ♂ and 1 ♀) are deposited at the U.S. National Museum, and the remaining 6 paratypes are to be found at the Academy of Natural Sciences of Philadelphia.

Diagnosis. — Distinguishable from the other subspecies of *aquila* by the presence of a face with golden to coppery pruinosity, and the apex of the femora and tibiae reddish.

Description: *MALE.* — As in the species description except total body length 3.77 to 4.90 mm.

Head length 0.95 to 1.02 mm. Face shining black with golden to coppery pruinosity.

Thorax with scutum length 1.22 to 1.39 mm; scutellum length 0.44 to 0.51 mm. *Legs* black except apex of femora, tibiae and tarsi reddish. *Wing* (Fig. 189) length from humeral crossvein 2.89 to 3.20 mm; width 1.22 to

1.36 mm; distance from h to R_1 0.82 to 0.95 mm; R_1 to R_{2+3} 1.53 to 1.77 mm; R_{2+3} to R_{4+5} 0.58 to 0.65 mm; R_{4+5} to M_{1+2} 0.31 mm; length R_{4+5} 1.80 to 1.94 mm; length M_{1+2} 1.16 to 1.29 mm; costal section from R_1 to R_{2+3} 2.4 to 2.8 times distance from R_{2+3} to R_{4+5}.

FEMALE. — Total body length 4.42 to 5.10 mm; remainder like males except as follows:

Head length 1.02 to 1.09 mm.

Thorax with scutum length 1.36 to 1.53 mm; scutellum length 0.51 to 0.54 mm. *Wing* length from humeral crossvein 3.30 to 3.50 mm; width 1.33 to 1.56 mm; distance from h to R_1 0.99 to 1.05 mm; R_1 to R_{2+3} 1.77 to 1.87 mm; R_{2+3} to R_{4+5} 0.61 to 0.68 mm; R_{4+5} to M_{1+2} 0.31 to 0.34 mm; length R_{4+5} 2.04 to 2.28 mm; length M_{1+2} 1.29 to 1.33 mm; costal section from R_1 to R_{2+3} 2.6 to 2.9 times distance from R_{2+3} to R_{4+5}.

Distribution. — Western U.S. and Canada (Fig. 225).

Specimens examined. — 296 specimens (126 ♂♂ and 170 ♀♀) from Arizona, California, Colorado, Idaho, Iowa, Kansas, Montana, Nebraska, New Mexico, Oregon, South Dakota, Texas, Utah, Washington, Wyoming, British Columbia, and Manitoba. Collected from April through November.

Parydra (Parydra) aurata Jones

Parydra aurata Jones, 1906:154-155; Cresson 1949:241-242.
Napaea (*Napaea*) *aurata* (Jones), Sturtevant and Wheeler 1954:222.

Types. — Cresson (1949) mentioned that *P. aurata* was described from San Francisco and the holotype (No. 4106) and the allotype (No. 4107), "present selection" are in the collection of the California Academy of Sciences. He also mentioned a paratype at the Academy of Natural Sciences of Philadelphia.

The senior author has secured two specimens from the California Academy of Sciences, a male labeled "lectotype" and a female labeled "allotype" and both bearing the labels San Francisco, Cal. with a date (v.27'08) which was scratched out. The lectotype bears the number 974 and the allotype number 712. The senior author was assured that these were the types of *Parydra aurata* but why Cresson lists a "holotype" and why the numbers he lists are different from those on the types observed remains unknown.

One paratype is located at the Academy of Natural Sciences of Philadelphia, as Cresson (1949) stated. This male specimen also bears the labels San Francisco, Cal. with the date (v.27'08) scratched out and the number 712.

Diagnosis. — Lateral scutellar tubercules absent, apical scutellar tubercules present, apical scutellar process absent, apex of scutellum distinctly pointed, orbital setae long, costal section of wing from R_1 to R_{2+3} 0.9 or more times distance from the R_{2+3} to R_{4+5}.

Description: *MALE.* — Total body length 3.64 to 4.15 mm; shining black with golden and greyish pruinosity. *Head* shining black with golden pruinosity except where noted; length 0.85 to 0.97 mm; ocellar triangle raised; 3 round ocelli; ocellar setae large, divergent; interocellar and postocellar setae small, divergent; 3 large pairs of orbital setae; eyes red, oval; vertex with golden pruinosity; 1 large pair of convergent, inner vertical setae; 1 large pair of divergent, exterior vertical setae; postorbitals and occipitals very small; gena with golden pruinosity. Face with golden pruinosity; convex when viewed in profile; facial depressions shallow but long, from antennal base to first parafacial seta; 1 large pair and 3 to 5 smaller pairs of parafacial setae. Clypeus with golden pruinosity, mouthparts with golden to greyish pruinosity. Antennae dark, brown to black with golden pruinosity; arista black, somewhat plumose.

Thorax shining black with golden pruinosity; faint greyish spots at intrascutal suture; faint greyish stripes anteriorly between dorsocentral and acrostichal setal rows; scutum length 1.05 to 1.22 mm; many long acrostichal setae; many long dorsocentral setae with 1 larger pair at intrascutal suture; 1 long pair of prescutellar setae; humeral and posthumeral setae long and fine; presuturals long and fine, 1 larger pair; 2 large pairs of notopleurals, posterior pair larger; 1 large pair of posterior intraalar setae; pleura shining black with golden pruinosity above, becoming greyish below and posteriorly; 1 large pair of mesopleural setae; sternum with greyish pruinosity; katepisternal spine absent. Scutellum (Fig. 147) shining black with golden pruinosity, length 0.51 to 0.61 mm, apical process absent but apex appears distinctly pointed, apical tubercules present, apical scutellar setae large, lateral tubercules absent, lateral scutellar setae large. *Legs* black except trochanters, tibiae, and tarsi reddish; legs covered with golden pruinosity; prothoracic tibiae with long yellow setae at apex; mesothoracic tibiae each with a spur and 2 or 3 large, black anterior setae at apex; apex of metathoracic tibiae with an anterior cluster of black setae and a yellow, posterior comb. *Wing* (Fig. 190) clouded, darkened areas around crossveins bounded by clear to whitish spots, very faint clear spot posterior to medial crossvein, no spot near middle of M_{1+2}; veins brown; length from humeral crossvein 2.79 to 2.89 mm; width 1.22 to 1.36 mm; distance from h to R_1 0.78 to 0.85 mm; R_1 to R_{2+3} 1.26 to 1.43 mm; R_{2+3} to R_{4+5} 0.75 to 0.82 mm; R_{4+5} to M_{1+2} 0.37 to 0.41 mm; length of R_{4+5} 1.53 to 1.70 mm; length of M_{1+2} 0.88 to 0.99 mm; costal section from R_1 to R_{2+3} 1.6 to 1.9 times distance from R_{2+3} to R_{4+5}; halteres yellow.

Abdomen as in Fig. 13 except where specified, shining black with mostly golden but some greyish pruinosity. Tergites 2 through 5 continuous dorsally or with fine lateral sutures; tergite 6, 7 and 8 absent. *Genitalia* as in Fig. 79. Note the paired gonites, rather short, narrower at base with rounded apices, fused to sternite 5 anteriorly and gonal arch posteriorly. Gonal arch

narrow and complete. Aedeagus large, boat-shaped with deeply lobed posterior margin, acute projections anteriorly, not fused to aedeagal apodeme.

FEMALE. — Total body length 3.91 to 4.28 mm. Head, thorax, legs, and wings as in males except where indicated.

Head length 0.88 to 0.99 mm.

Thorax with scutum length 1.12 to 1.26 mm; scutellum length 0.51 to 0.61 mm. *Wing* length from humeral crossvein 2.82 to 3.06 mm; width 1.22 to 1.43 mm; distance from h to R_1 0.78 to 0.85 mm; R_1 to R_{2+3} 1.39 to 1.46 mm; R_{2+3} to R_{4+5} 0.78 to 0.81 mm; R_{4+5} to M_{1+2} 0.37 mm; length of R_{4+5} 1.63 to 1.77 mm; length of M_{1+2} 0.91 to 1.02 mm; costal section from R_1 to R_{2+3} 1.8 to 1.9 times distance from R_{2+3} to R_{4+5}.

Abdomen as in Fig. 47. Ventral receptacle as in Fig. 115.

Distribution. — Far western U.S. and southwestern Canada (Fig. 228).

Specimens examined. — 461 specimens (210 ♂♂ and 251 ♀♀) from Arizona, California, Idaho, Nevada, New Mexico, Oregon, Utah, Washington, Baja California, and British Columbia. Collected all months of the year except January and March.

Parydra (Parydra) breviceps Loew

Parydra breviceps Loew, 1862:167; Cresson 1949:223-224.
Parydra limpidipennis Loew, 1878:201-202.
Parydra vicina Cresson, 1940:9-10; Cresson 1949:224-225.
Napaea (*Napaea*) *breviceps breviceps* (Loew), Sturtevant and Wheeler 1954:223.
Napaea (*Napaea*) *breviceps vicina* (Cresson), Sturtevant and Wheeler 1954:223.

The senior author has examined the holotype ♂ of *P. limpidipennis* (Type 11170, D.C., Loew Coll., deposited at the Museum of Comparative Zoology, Harvard) and it is certainly synonomous with *P. breviceps*. This was recognized previously by Cresson (1949) and Sturtevant and Wheeler (1954).

In 1949, Cresson mentioned the possibility that *P. vicina* might be a subspecies of *P. breviceps*. Sturtevant and Wheeler (1954) made the synonomy and retained *vicina* as a subspecies based on an indistinct color character and a distributional difference (*breviceps*, Arizona and eastward; *vicina*, Arizona and westward). The senior author's examination of the types and many specimens of each convinces him that they are synonomous and there appears to be no reason to retain *vicina* as a subspecies.

The holotype ♂ and 11 paratypes (4 ♂♂ and 7 ♀♀) of *vicina* labeled Berkeley Hills, Alameda Co., Cal., IV.11'08 are located in the Academy of Natural Sciences of Philadelphia, Pennsylvania. Though Cresson (1940) mentioned 13 paratypes (5 ♂♂ and 8 ♀♀), it is possible that 2 paratypes are lost. However, there are 2 females which lack paratype labels but bear the same locality labels. Perhaps these were considered as types by Cresson.

Type. — This species was described from a single female specimen (Type 11174) labeled Middle St., Loew Coll., and deposited in the Museum of Comparative Zoology, Harvard.

Diagnosis. — Lateral scutellar tubercules absent, apical scutellar tubercules present, apical scutellar process absent, apex of scutellum rounded or blunt, orbital setae long, facial pruinosity golden or bright coppery, femora black (apex may be reddish), tibiae and tarsi reddish, and costal section of wing from R_1 to R_{2+3} 1.1 to 1.6 times distance from R_{2+3} to R_{4+5}.

Description: *MALE.* — Total body length 2.55 to 3.40 mm; shining black with golden to coppery pruinosity. *Head* shining black with coppery pruinosity except as indicated; length 0.58 to 0.68 mm; ocellar triangle raised; 3 round ocelli; ocellar setae large, divergent; interocellar and postocellar setae small, divergent; 3 large pairs and 1 or 2 small pairs of orbital setae; eyes red, oval; vertex with coppery pruinosity above, becoming golden below, sometimes greyish below and medially; 1 large pair of convergent, inner vertical setae; 1 large pair of divergent, exterior vertical setae; postorbitals and occipitals small; gena shining black with golden pruinosity. Face shining black with golden or bright coppery pruinosity; convex when viewed in profile; facial depressions small; 1 large pair and 4 to 6 smaller pairs of parafacial setae. Clypeus with golden or bright coppery pruinosity; mouthparts with greyish pruinosity. Antennae dark reddish to black with coppery pruinosity; arista black, slightly plumose.

Thorax shining black with coppery pruinosity; faint greyish stripes laterally along dorsocentral setal rows, between dorsocentral and acrostichal setal rows, and medially between acrostichal setal rows; scutum length 0.71 to 0.88 mm; many long acrostichal and dorsocentral setae of about the same length; 1 long pair of prescutellar setae; humeral and posthumeral setae long and fine; presuturals long and fine, 1 large pair; 2 large pairs of notopleurals, posterior pair larger; 1 large pair of posterior intraalar setae; pleura shining black with golden to coppery pruinosity above, becoming greyish below; 1 large pair of mesopleural setae; sternum with greyish pruinosity; katepisternal spine absent. Scutellum (Fig. 148) shining black with golden and coppery pruinosity, length 0.34 to 0.41 mm; apical process absent and apex rounded or blunt, apical tubercules present, apical scutellar setae large, lateral tubercules absent, lateral scutellar setae large. *Legs* black except trochanters, apex

of femora, tibiae, and tarsi reddish; legs covered with greyish pruinosity; prothoracic tibiae with long yellow setae at apex; mesothoracic tibiae each with a spur and 3 large, black anterior setae; apex of metathoracic tibiae with an anterior cluster of black setae and a yellow posterior comb. *Wing* (Fig. 191) lightly clouded, very slightly darkened areas around crossveins but not bounded by spots; veins brown; appendage rarely present at apex of R_{2+3}; length from humeral crossvein 2.04 to 2.58 mm; width 0.85 to 1.09 mm; distance from h to R_1 0.58 to 0.75 mm; R_1 to R_{2+3} 0.78 to 1.12 mm; R_{2+3} to R_{4+5} 0.65 to 0.75 mm; R_{4+5} to M_{1+2} 0.24 to 0.27 mm; length R_{4+5} 1.19 to 1.46 mm; length M_{1+2} 0.65 to 0.85 mm; costal section from R_1 to R_{2+3} 1.1 to 1.6 times distance from R_{2+3} to R_{4+5}; halteres yellow with light brown capitellum.

Abdomen as in Fig. 14 except where mentioned; shining black with greyish pruinosity posteriorly and laterally on tergites. Tergites 2 through 5 continuous dorsally or with fine lateral sutures; tergites 6, 7 and 8 absent. Sternites 3 and 4 sometimes with 2 small anterior fragments, sternite 5 closely attached to sternite 6 and with 2 or 4 strongly sclerotized lateral fragments, sternite 6 sometimes with lateral projections. *Genitalia* as in Fig. 80. Note the long paired gonites with rounded apices, fused to sternite 6 anteriorly, fused to gonal arch posteriorly. Gonal arch complete dorsally and with a large triangular dorsal plate associated closely with dorsum of aedeagus. Aedeagus long and boat-shaped, not fused to aedeagal apodeme.

FEMALE. — Total body length 3.13 to 3.57 mm. Head, thorax, legs and wings as in males except as noted.

Head length 0.68 to 0.75 mm; parafacial setae, 1 large pair and 3 to 7 smaller pairs.

Thorax with scutum length 0.88 to 0.95 mm; scutellum length 0.41 to 0.48 mm. *Wing* length from humeral crossvein 2.48 to 2.75 mm; width 1.09 to 1.22 mm; distance from h to R_1 0.71 to 0.85 mm; R_1 to R_{2+3} 0.95 to 1.19 mm; R_{2+3} to R_{4+5} 0.78 to 0.92 mm; R_{4+5} to M_{1+2} 0.27 to 0.31 mm; length R_{4+5} 1.43 to 1.60 mm; length M_{1+2} 0.82 to 0.92 mm; costal section from R_1 to R_{2+3} 1.2 to 1.5 times distance from R_{2+3} to R_{4+5}.

Abdomen as in Fig. 48 except sternite 8 sometimes blunt anteriorly, without broad "U" notch. Ventral receptacle as in Fig. 116.

Distribution. — North America between latitudes 30 and 50 degrees North, uncommon in Rocky Mountains.

Specimens examined. — 1,293 specimens (551 ♂♂ and 742 ♀♀) from Arizona, Arkansas, California, Colorado, Connecticut, Delaware, D.C., Florida, Georgia, Illinois, Indiana, Iowa, Kansas, Kentucky, Louisiana, Maryland, Massachusetts, Michigan, Minnesota, Mississippi, Missouri, Nebraska, Nevada, New Hampshire, New Jersey, New York, North Carolina, Ohio, Oklahoma, Oregon, Pennsylvania, South Carolina, South Dakota, Tennessee, Texas, Utah,

Virginia, West Virginia, Wisconsin, Baja California, Ontario, and Quebec. Collected all months of the year except November and January.

Parydra (Parydra) humilis Williston

Parydra humilis Williston, 1897:7; Cresson 1934:214.
Napaea humilis Williston, Cresson 1918:64.
Parydra humeralis Cresson, 1931:104.

Type. — This species was described by Williston (1897) from 2 specimens from Rio de Janeiro (Smith). One specimen is a male and from Williston's wording the other is probably a female. We have tried to locate the type or type series (2 specimens) but without success. The senior author has examined 5 specimens from Rio de Janeiro and believes that Williston's description is sufficient to identify these specimens as *P. humilis*. Also examined are 107 other specimens from various localities in North and South America and there is no question but that these fit Williston's description.

Among the total of 112 specimens examined one ♀ specimen in Cresson's collection at the Academy of Natural Sciences of Philadelphia bears the following labels: comp'd W. Type? *Parydra humilis* Will. det. E. T. Cresson, 1918;192; Cartago, Costa Rica; 25.V '09; P. P. Calvert. Another ♀ in Cresson's collection is labeled "Topotype" *Parydra humilis* W.; Rio de Janeiro, Brazil; 9-934; H. Souza Lopes.

Diagnosis. — Lateral scutellar tubercules absent; apical scutellar tubercules present; apical scutellar process absent; apex of scutellum rounded or blunt; orbital setae long; femora, tibiae and tarsi reddish; and costal section of wing from R_1 to R_{2+3} 1.6 to 2.1 times distance from R_{2+3} to R_{4+5}.

Description: *MALE.* — Total body length 3.16 to 3.91 mm; shining black with golden pruinosity. *Head* shining black with golden pruinosity except where mentioned; length 0.65 to 0.75 mm; ocellar triangle raised; 3 round ocelli; ocellar setae large, divergent; interocellar and postocellar setae small, divergent; 3 large pairs and 1 small pair of orbital setae; eyes red, oval; vertex with golden pruinosity; 1 large pair of convergent, inner vertical setae; 1 large pair of divergent, exterior vertical setae; postorbitals and occipitals small; gena with golden to greyish pruinosity. Face shining black with golden pruinosity; convex when viewed in profile; facial depressions small; 1 large pair and 6 to 8 smaller pairs of parafacial setae. Clypeus with golden to greyish pruinosity; mouthparts with greyish pruinosity. Antennae dark brown to black with golden pruinosity; arista black, somewhat plumose.

Thorax shining black with golden pruinosity; very faint, greyish stripes laterally along dorsocentral setae, between dorsocentral and acrostichal setal rows, and medially between acrostichal setal rows; scutum length 0.92 to 1.02 mm; many long acrostichal setae; many long dorsocentral setae with 3 pairs being larger than others, 1 pair at intrascutal suture and 2 pairs posterior; 1 long pair of prescutellar setae; humeral and posthumeral setae long and fine; presuturals long and fine, 1 larger pair; 2 large pairs of notopleurals, posterior pair larger; 1 large pair of posterior intraalar setae; pleura shining black with greyish and some golden pruinosity; 1 large pair of mesopleural setae; sternum with greyish pruinosity; katepisternal spine absent. Scutellum (Fig. 149) shining black with golden pruinosity, length 0.34 to 0.44 mm, apical process absent and apex rounded or blunt, apical tubercules present, apical scutellar setae large, lateral tubercules absent, lateral scutellar setae large. *Legs* reddish except base of coxae black; legs covered with greyish pruinosity; prothoracic tibiae with long yellow setae at apex; mesothoracic tibiae each with a spur and 2 large, black anterior setae; apex of metathoracic tibiae with an anterior cluster of dark reddish to black setae and a yellow posterior comb. *Wing* (Fig. 192) clear, sometimes very lightly darkened around crossveins, no white spots; veins brown or reddish; length from humeral crossvein 2.21 to 2.58 mm; width 0.88 to 1.12 mm; distance from h to R_1 0.61 to 0.75 mm; R_1 to R_{2+3} 1.05 to 1.22 mm; R_{2+3} to R_{4+5} 0.54 to 0.68 mm; R_{4+5} to M_{1+2} 0.24 to 0.34 mm; length R_{4+5} 1.36 to 1.67 mm; length M_{1+2} 0.85 to 1.05 mm; costal section from R_1 to R_{2+3} 1.7 to 2.1 times distance from R_{2+3} to R_{4+5}; halteres yellow.

Abdomen as in Fig. 15 except as noted; shining black with coppery pruinosity on anterior and posterior margins of tergites, greyish pruinosity in middle. Tergites 2 through 5 continuous dorsally or with fine lateral sutures; tergites 6, 7 and 8 absent; anterior fragment of tergite 8 sometimes fused with tergite. *Genitalia* as in Fig. 81. Note the long, narrow, paired gonites with blunt apices, fused to sternite 5 anteriorly. Gonal arch absent or incomplete dorsally. Aedeagus slipper-like, not fused to aedeagal apodeme, with a dorsal accessory sclerite.

FEMALE. — Total body length 3.33 to 4.15 mm. Head, thorax, legs, and wings as in males except where indicated.

Head length 0.71 to 0.81 mm.

Thorax with scutum length 1.09 to 1.16 mm; scutellum length 0.44 to 0.48 mm. *Wing* length from humeral crossvein 2.75 to 2.92 mm; width 1.16 to 1.22 mm; distance from h to R_1 0.71 to 0.78 mm; R_1 to R_{2+3} 1.26 to 1.43 mm; R_{2+3} to R_{4+5} 0.75 to 0.78 mm; R_{4+5} to M_{1+2} 0.31 to 0.34 mm; length R_{4+5} 1.70 to 1.73 mm; length M_{1+2} 1.09 to 1.16 mm; costal section from R_1 to R_{2+3} 1.6 to 1.8 times distance from R_{2+3} to R_{4+5}.

Abdomen as in Fig. 49. Ventral receptacle as in Fig. 117.

Distribution. — North and South America from southern California to central Argentina (Fig. 231).

Specimens examined. — 112 specimens (57 ♂♂ and 55 ♀♀) from the following countries: U.S. (California), Mexico, West Indies, Cuba, Costa Rica, Panama, Ecuador, Brazil, Uruguay, Paraguay, and Argentina. Collected in every month except August.

Parydra (Parydra) imitans Loew

Parydra imitans Loew, 1878:201; Cresson 1949:242-243.
Napaea (*Napaea*) *imitans* (Loew), Sturtevant and Wheeler 1954:223-224.
Napaea (*Napaea*) *trituberculata* Sturtevant and Wheeler, 1954:225.

An examination of the holotype ♂ and 83 specimens of *Parydra imitans* and the holotype ♂ and 4 specimens of *P. trituberculata* convinces me that they are synonomous species. The holotype ♂ of *trituberculata* from Coden, Alabama, Oct. 15, 1924 is deposited in the Academy of Natural Sciences of Philadelphia, Pennsylvania. Sturtevant and Wheeler (1954) mentioned a paratype from Gulfport, Mississippi (sex not indicated) deposited in the Cornell University collection. The senior author has not seen this paratype but has seen one specimen from the Cornell University collection labeled *Napaea* n.sp. and from the same locality with the date June 14, 1917. This may be the paratype to which Sturtevant and Wheeler (1954) referred.

Type. — This species was described from a single male specimen bearing the labels Type 11169, Mass., and Loew Collection. This holotype is deposited in the Museum of Comparative Zoology, Harvard.

Diagnosis. — Lateral scutellar tubercules absent; apical scutellar tubercules present and distinct; apical scutellar process long and narrow; orbital setae long; wings without a crossvein joining R_{2+3} and R_{4+5}, R_{2+3} not appendiculate at apex; and tibiae reddish.

Description: *MALE.* — Total body length 3.13 to 4.32 mm; shining black with golden, coppery and greyish pruinosity. *Head* shining black with golden pruinosity except where specified; length 0.68 to 0.88 mm; ocellar triangle raised; 3 round ocelli; ocellar setae large, divergent; interocellar and postocellar setae small, divergent; 3 large pairs of orbital setae; eyes red, oval; vertex with golden pruinosity above, becoming golden to greyish below; 1 large pair of convergent, inner vertical setae; 1 large pair of divergent, exterior vertical setae; postorbitals and occipitals small; gena shining black with greyish but some golden pruinosity. Face shining black with greyish pruinosity, sometimes with golden or coppery pruinosity; facial depressions long, from antennal base to first parafacial seta; 2 large pair and 2 or 3 smaller pairs of parafacial setae. Clypeus with silvery grey to golden pruinosity; mouthparts with greyish pruinosity. Antennae reddish with coppery pruin-

osity; arista black, somewhat plumose.

Thorax shining black with golden to coppery pruinosity; faint greyish stripes laterally along dorsocentral setae, between dorsocentral and acrostichal setal rows, and medially between acrostichal setal rows; scutum length 1.02 to 1.22 mm; many long acrostichal setae; many long dorsocentral setae with 3 pairs being larger than others, 1 pair at intrascutal suture and 2 pairs farther posterior; 1 long pair of prescutellar setae; humeral and posthumeral setae long and fine; presuturals long and fine, 1 larger pair; 2 large pairs of notopleurals, posterior pair larger; 1 large pair of posterior intraalar setae; pleura shining black with greyish pruinosity, golden below wing base; 1 large pair of mesopleural setae; sternum with greyish pruinosity; katepisternal spine absent. Scutellum (Fig. 150) shining black with golden pruinosity, length 0.51 to 0.71 mm, apical process long and narrow, apical tubercules present, apical scutellar setae large, lateral tubercules absent, lateral scutellar setae large. *Legs* with coxae and femora black; trochanters, tibiae and tarsi reddish; legs covered with greyish pruinosity; prothoracic tibiae with long yellow setae at apex; mesothoracic tibiae each with a spur and 3 large, black anterior setae; apex of metathoracic tibiae with an anterior cluster of black setae and a yellow posterior comb. *Wing* (Fig. 193) slightly clouded, darkened areas around crossveins bounded by faintly lighter areas, no lighter areas posterior to medial crossvein or near middle of M_{1+2}; veins brown; length from humeral crossvein 2.48 to 3.30 mm; width 1.09 to 1.33 mm; distance from h to R_1 0.75 to 0.92 mm; R_1 to R_{2+3} 0.95 to 1.39 mm; R_{2+3} to R_{4+5} 0.78 to 0.99 mm; R_{4+5} to M_{1+2} 0.31 to 0.37 mm; length R_{4+5} 1.39 to 1.90 mm; length M_{1+2} 0.82 to 1.12 mm; costal section from R_1 to R_{2+3} 1.1 to 1.5 times distance from R_{2+3} to R_{4+5}; halteres yellow.

Abdomen as in Fig. 16 except as noted; shining black with greyish pruinosity, denser pruinosity on posterior half of tergites. Tergites 2 through 5 continuous dorsally or with fine lateral sutures; tergites 6, 7 and 8 absent. Sternite 4 variably shaped, basically oval with anterior or posterior notches, with or without 2 anterior fragments; sternite 5 with or without 2 anterior fragments. *Genitalia* as in Fig. 82. Note the somewhat triangular, paired gonites with curved, pointed apices; fused to sternite 5 anteriorly; not fused to gonal arch. Gonal arch large with curved, pointed apex. Aedeagus long and pointed with small accessory sclerite, not fused to aedeagal apodeme. Aedeagal apodeme very large.

FEMALE. — Total body length 3.33 to 4.01 mm. Head, thorax, legs and wings as in males except where mentioned.

Head length 0.78 to 0.88 mm.

Thorax with scutum length 1.12 to 1.32 mm; scutellum length 0.58 to 0.71 mm. *Wing* length from humeral crossvein 2.79 to 3.33 mm; width 1.16 to 1.36 mm; distance from h to R_1 0.82 to 0.95 mm; R_1 to R_{2+3} 1.19 to 1.53 mm; R_{2+3} to R_{4+5} 0.92 to 1.02 mm; R_{4+5} to M_{1+2} 0.34 to 0.37 mm; length R_{4+5} 1.73 to 1.97 mm; length M_{1+2} 1.02 to 1.16 mm; costal section from R_1 to R_{2+3} 1.2 to 1.6 times distance from R_{2+3} to R_{4+5}.

Abdomen as in Fig. 50. Ventral receptacle as in Fig. 118.

Distribution. — Eastern U.S. and Canada, Atlantic and Gulf Coastal areas (Fig. 227).

Specimens examined. — 87 specimens (38 ♂♂ and 49 ♀♀) from Alabama, Connecticut, Florida, Georgia, Maine, Massachusetts, Mississippi, New Hampshire, New Jersey, New York, New Brunswick, and Nova Scotia. Collected from March through October.

Parydra (Parydra) incommoda Cresson

Parydra incommoda Cresson, 1930:81; Cresson 1949:247-248.
Napaea (*Parydra*) *incommoda* (Cresson), Sturtevant and Wheeler 1954:228.

Types. — Described from a holotype ♂, allotype and 7 paratypes (3 ♂♂ and 4 ♀♀) collected from Moscow Mt., Idaho on 12.VI.10. The holotype, allotype and 1 ♀ paratype are deposited in the Academy of Natural Sciences of Philadelphia, Pennsylvania and the remaining paratypes are deposited in the U.S. National Museum, Washington, D.C.

Diagnosis. — Lateral scutellar tubercules present, apical scutellar process absent, apical scutellar tubercules present and the distance between them distinctly greater than their length, orbital setae short, facial pruinosity dark coppery, katepisternal spine absent, mesofemora of males with a dense posterior flexor row of setae, and females with sternite 8 deeply notched on posterior.

Description: *MALE.* — Total body length 4.08 to 4.69 mm; shining black with coppery, golden and greyish pruinosity. *Head* shining black with coppery pruinosity except as noted; length 0.95 to 1.05 mm; ocellar triangle raised; 3 round ocelli; ocellar setae small, divergent; interocellar and postocellar setae very small, divergent; 2 or 3 small pairs of orbital setae, 1 very small pair; eyes red, oval; vertex with coppery pruinosity above, becoming golden below but whitish to greyish below and medially; 1 small pair of convergent, inner vertical setae; 1 small pair of divergent, exterior vertical setae; postorbitals and occipitals very small; gena shining black with golden to coppery pruinosity. Face shining black with dark coppery pruinosity; facial depressions long, shallow, from antennal base to first parafacial seta; 1 large pair and 4 to 6 smaller pairs of parafacial setae. Clypeus with coppery pruinosity; mouthparts with greyish pruinosity. Antennae brown to black with coppery pruinosity; arista black, somewhat plumose.

Thorax shining black with golden to coppery pruinosity; faint greyish stripes between dorsocentral and acrostichal setal rows; scutum length 1.26 to 1.33 mm; many small acrostichal and dorsocentral setae; 1 long pair of prescutellar setae; humeral, posthumeral and presutural setae very small and fine; 2 large pairs of notopleurals, posterior pair larger; 1 large pair of posterior

intraalar setae; pleura shining black with golden pruinosity above, becoming greyish below and posterior; 1 large pair of mesopleural setae; sternum with greyish pruinosity; katepisternal spine absent. Scutellum (Fig. 151) shining black with golden to coppery pruinosity, length 0.54 mm, apical process absent, apical tubercules present and farther apart than their length, apical scutellar setae large, lateral tubercules present, lateral scutellar setae large. *Legs* black except trochanters and tarsi reddish; legs covered with greyish pruinosity; prothoracic tibiae with long yellow setae at apex; mesothoracic femora of males with a dense posterior flexor row of setae (Fig. 181); mesothoracic tibiae each with a spur and 3 small black anterior setae; apex of metathoracic tibiae with an anterior cluster of black setae and a yellow posterior comb. *Wing* (Fig. 194) very slightly clouded, slightly darkened at crossveins, not bounded by whitish spots, no other whitish spots present; veins brown; length from humeral crossvein 3.30 to 3.67 mm; width 1.43 to 1.53 mm; distance from h to R_1 0.95 to 1.09 mm; R_1 to R_{2+3} 1.70 to 1.90 mm; R_{2+3} to R_{4+5} 0.68 to 0.71 mm; R_{4+5} to M_{1+2} 0.37 to 0.41 mm; length R_{4+5} 1.94 to 2.21 mm; length M_{1+2} 1.26 to 1.39 mm; costal section from R_1 to R_{2+3} 2.5 to 2.7 times distance from R_{2+3} to R_{4+5}; halteres yellow.

Abdomen as in Fig. 18 except where specified; shining black with golden pruinosity. Tergites 2 through 5 continuous dorsally or with fine lateral sutures; tergites 6, 7 and 8 absent. Sternites 2 and 3 with or without anterior fragments. *Genitalia* as in Fig. 83. Note the paired gonites which are sharply bent upward at middle, fused to sternite 6 anteriorly, connected to gonal arch posteriorly. Gonal arch narrow and complete dorsally. Aedeagus pointed and curved, not fused to aedeagal apodeme.

FEMALE. — Total body length 4.35 to 4.93 mm. Head, thorax, legs and wings as in males except as noted.

Head length 1.02 to 1.09 mm; parafacial setae, 1 large pair and 5 to 8 smaller pairs.

Thorax with scutum length 1.29 to 1.43 mm; scutellum length 0.54 to 0.62 mm. *Wing* length from humeral crossvein 3.64 to 4.25 mm; width 1.46 to 1.70 mm; distance from h to R_1 1.02 to 1.16 mm; R_1 to R_{2+3} 1.70 to 2.11 mm; R_{2+3} to R_{4+5} 0.75 to 0.78 mm; R_{4+5} to M_{1+2} 0.37 to 0.41 mm; length R_{4+5} 2.24 to 2.45 mm; length M_{1+2} 1.39 to 1.46 mm; costal section from R_1 to R_{2+3} 2.3 to 2.7 times distance from R_{2+3} to R_{4+5}.

Abdomen as in Fig. 51. Note sternite 8 with the deep U-shaped posterior notch. Ventral receptacle as in Fig. 119.

Distribution. — Western U.S. and Canada (Fig. 227).

Specimens examined. — 353 specimens (127 ♂♂ and 226 ♀♀) from Arizona, California, Colorado, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington, Wyoming, Alberta, and British Columbia. Collected from May through October.

Parydra (Parydra) lynetteae n.sp.

Types. — Holotype ♂, 1 ♂ and 5 ♀ paratypes from 2.5 mi. E. Chilpancingo; 5 mi. S. Guerreo; Mexico; Aug. 5, 1962; N. Marston-6. 2 ♂ paratypes with same data except Aug. 3, 1962; N. Marston-4a; and 1 ♀ paratype with same data except Aug. 4, 1962; N. Marston-5. One ♂ paratype (Aug. 3, 1962; N. Marston-4a) retained in the author's collection and 1 ♂ paratype with this data is deposited in the collection of the U.S. National Museum. The remaining holotype ♂, 1 ♂ and 6 ♀ paratypes are deposited in the collection of Kansas State University at Manhattan, Kansas. Also, 1 ♂ paratype from Sonora Alamos, Mexico, 25.II.1963, P. H. Arnaud, Jr. is deposited in the collection of the California Academy of Sciences.

Diagnosis. — Lateral and apical scutellar tubercules absent, apical scutellar process absent, orbital setae long, face concave when viewed in profile, facial pruinosity golden or coppery, costal section of wing from R_1 to R_{2+3} 1.5 or more times distance from R_{2+3} R_{4+5}. *Male* with gonal arch present and aedeagus not fused to aedeagal apodeme. *Female* ventral receptacle with large cap which covers all but the apex.

Description: *MALE.* — Total body length 3.06 to 3.30 mm; shining black with coppery, golden and greyish pruinosity. *Head* shining black with coppery pruinosity except where noted; length 0.61 to 0.65 mm; ocellar triangle raised; 3 round ocelli; ocellar setae large, divergent; interocellar and postocellar setae small, divergent; 2 large pairs of orbital setae; eyes red, oval; vertex with coppery pruinosity above, becoming greyish below; 1 large pair of convergent, inner vertical setae; 1 large pair of divergent, exterior vertical setae; postorbitals and occipitals very small; gena black with golden pruinosity. Face shining black with golden pruinosity; concave when viewed in profile; facial depressions large, from antennal base to first parafacial seta; 1 or 2 small anterior pairs, followed by 1 large pair, and 8 to 11 small posterior pairs of parafacial setae. Clypeus with golden pruinosity; mouthparts with greyish pruinosity. Antennae dark, brown to black with coppery pruinosity; arista black, somewhat plumose.

Thorax shining black with coppery pruinosity; faint, greyish stripes laterally along dorsocentral setae and between dorsocentral and acrostichal setal rows; scutum length 0.75 to 0.99 mm; many long acrostichal setae; many long dorsocentral setae with 3 pairs being larger than others, 1 pair at intrascutal suture and 2 pairs farther posterior; 1 long pair of prescutellar setae; humeral and posthumeral setae long and fine; presuturals long and fine, 1 larger pair; 2 large pairs of notopleurals, posterior pair larger; 1 large pair of posterior intraalar setae; pleura shining black with coppery to golden pruinosity above, becoming greyish below and posteriorly; 1 large pair of mesopleural setae; sternum with greyish pruinosity; katepisternal spine absent. Scutellum (Fig.

152) shining black with coppery pruinosity; length 0.31 to 0.34 mm; apical process absent, apical tubercules present, apical scutellar setae large, lateral tubercules absent, lateral scutellar setae large. *Legs* black except trochanters, apex of femora, tibiae and tarsi reddish; legs covered with golden and greyish pruinosity; prothoracic tibiae with long yellow setae at apex; mesothoracic tibiae each with a spur and 3 large, black anterior setae; apex of metathoracic tibiae with an anterior cluster of black setae and a yellow, posterior comb. *Wing* (Fig. 195) lightly clouded, darkened areas around crossveins bounded by faintly lighter spots, no lighter areas posterior to medial crossvein or near middle of M_{1+2}; veins brown; length from humeral crossvein 1.97 to 2.35 mm; width 0.85 to 1.05 mm; distance from h to R_1 0.54 to 0.65 mm; R_1 to R_{2+3} 0.88 to 1.05 mm; R_{2+3} to R_{4+5} 0.58 to 0.61 mm; R_{4+5} to M_{1+2} 0.24 to 0.27 mm; length of R_{4+5} 1.19 to 1.36 mm; length of M_{1+2} 0.75 to 0.88 mm; costal section from R_1 to R_{2+3} 1.5 to 1.7 times distance from R_{2+3} to R_{4+5}; halteres yellow.

Abdomen as in Fig. 19 except where mentioned; shining black with golden pruinosity anteriorly, becoming greyish posteriorly on tergites. Tergites 2 through 5 continuous dorsally or with fine lateral sutures; tergites 6, 7 and 8 absent. *Genitalia* as in Fig. 85. Note the paired gonites with rounded apices, fused to sternite 5 anteriorly and gonal arch posteriorly. Gonal arch narrow with short lateral projections connecting with aedeagus. Aedeagus boat-shaped, not fused to aedeagal apodeme.

FEMALE. — Total body length 3.64 to 3.71 mm. Head, thorax, legs and wings as in males except where mentioned.

Head length 0.75 to 0.82 mm.

Thorax with scutum length 1.09 to 1.16 mm; scutellum length 0.37 to 0.44 mm. *Wing* length from humeral crossvein 2.65 to 2.75 mm; width 1.16 to 1.19 mm; distance from h to R_1 0.71 to 0.78 mm; R_1 to R_{2+3} 1.26 to 1.33 mm; R_{2+3} to R_{4+5} 0.65 mm; R_{4+5} to M_{1+2} 0.31 mm; length of R_{4+5} 1.60 to 1.63 mm; length of M_{1+2} 0.95 to 0.99 mm; costal section from R_1 to R_{2+3} 1.9 to 2.1 times distance from R_{2+3} to R_{4+5}.

Abdomen as in Fig. 52. Ventral receptacle as in Fig. 120.

Distribution. — Western Mexico (Fig. 227).

Specimens examined. — 11 specimens (5 ♂♂ and 6 ♀♀, 1 holotype ♂ and 10 paratypes) with data as listed previously for types.

Parydra (Parydra) penabbreviata n.sp.

Types. — Holotype ♂ from Falls Church, Virginia; July 1954; M. R. Wheeler. 1 ♀ paratype from same locality but collected July 13, '54; M. R. Wheeler. The holotype and paratype are both deposited in the collection of the U.S. National Museum.

Diagnosis. — Lateral scutellar tubercules and apical scutellar tubercules absent; apical scutellar process present and large; orbital setae long; face con-

vex to concave when viewed in profile; facial pruinosity grey. *Male* with gonites rounded apically, gonal arch present, aedeagus and aedeagal apodeme not fused. *Female* with sternite 8 consisting of a single median sclerite with a deep posterior notch, sternite 7 with a large anterior notch.

Description: *MALE.* — Total body length 2.86 mm; shining black with golden, coppery, and grey pruinosity. *Head* shining black with coppery pruinosity except where indicated; length 0.61 mm; ocellar triangle raised; 3 round ocelli; ocellar setae large, divergent; interocellar and postocellar setae small, divergent; 2 large pairs of orbital setae; eyes red, oval; vertex with coppery pruinosity above, becoming golden below; 1 large pair of convergent, inner vertical setae; 1 large pair of divergent, exterior vertical setae; postorbitals and occipitals very small; gena black with golden pruinosity. Face shining black with grey pruinosity; convex to concave when viewed in profile; facial depressions long, from antennal base to first parafacial seta; 1 large pair and 3 smaller pairs of parafacial setae. Clypeus with grey pruinosity medially, becoming golden laterally; mouthparts with greyish pruinosity. Antennae dark, brown to black, with coppery pruinosity; arista dark brown, plumose.

Thorax shining black with golden to coppery pruinosity; greyish spots at intrascutal suture; greyish stripes on anterior and posterior of thorax, appearing as spots, laterally along dorsocentral setae, between dorsocentral and acrostichal setal rows, and medially between acrostichal setal rows; scutum length 0.82 mm; many long acrostichal setae; many long dorsocentral setae with 3 pairs being larger than others, 1 pair at intrascutal suture and 2 pairs farther posterior; 1 long pair of prescutellar setae; humeral and posthumeral setae long and fine; presuturals long and fine, 1 larger pair; 2 large pairs of notopleurals, posterior pair larger; 1 large pair of posterior intraalar setae; pleura shining black with dull coppery to golden pruinosity above, becoming greyish below; 1 large pair of mesopleural setae; sternum with greyish pruinosity; katepisternal spine absent. Scutellum (Fig. 153) shining black with coppery pruinosity medially, becoming greyish on anterolateral angles; length 0.37 mm; apical process present and large; apical tubercules absent; apical scutellar setae large; lateral tubercules absent; lateral scutellar setae large. *Legs* black except trochanters, apex of femora, tibiae and tarsi reddish; legs covered with greyish pruinosity; prothoracic tibiae with long yellow setae at apex; mesothoracic tibiae each with a spur and 3 large, black anterior setae; apex of metathoracic tibiae with an anterior cluster of black setae and a reddish, posterior comb. *Wing* (Fig. 196) clouded, darkened areas around crossveins bounded by clear to whitish spots, one such spot posterior to medial crossvein and one near middle of M_{1+2}, one whitish spot at tip of appendage of R_{2+3}; veins brown; length from humeral crossvein 1.90 mm; width 0.88 mm; distance from h to R_1 0.58 mm; R_1 to R_{2+3} 0.48 mm; R_{2+3} to R_{4+5} 0.71 mm; R_{4+5} to M_{1+2} 0.37 mm; length of R_{4+5} 0.68 mm; length of M_{1+2} 0.48 mm; costal section from R_1 to R_{2+3} 0.7 times distance from R_{2+3} to R_{4+5}; halteres with yellow base and reddish capitellum.

Abdomen as in Fig. 17 except as noted; shining black with coppery pruinosity anteriorly and medially, becoming greyish posteriorly and laterally on tergites. Tergites 2 through 5 with fine lateral sutures; tergites 6, 7 and 8 absent. *Genitalia* as in Fig. 84. Note the paired gonites with long, narrow, rounded apices, fused to gonal arch posteriorly, connected to sternite 5 anteriorly. Gonal arch narrow with long, wide, medial projection connecting with aedeagus. Aedeagus boat-shaped, not fused to aedeagal apodeme.

FEMALE. — Total body length 3.09 mm. Head, thorax, legs and wings as in males except where mentioned.

Head length 0.68 mm; parafacial setae, 1 large pair and 3 or 4 smaller pairs.

Thorax with scutum length 0.85 mm; scutellum length 0.41 mm. *Wing* length from humeral crossvein 1.94 mm; width 1.02 mm; distance from h to R_1 0.68 mm; R_1 to R_{2+3} 0.51 mm; R_{2+3} to R_{4+5} 0.71 mm; R_{4+5} to M_{1+2} 0.34 mm; length R_{4+5} 0.99 mm; length M_{1+2} 0.48 mm; costal section from R_1 to R_{2+3} 0.7 times distance from R_{2+3} to R_{4+5}.

Abdomen as in Fig. 53. Ventral receptacle as in Fig. 121.

Distribution. — Virginia (Fig. 232).

Specimens examined. — Holotype ♂ and 1 paratype ♀ with the same data as listed previously for types.

Parydra (Parydra) pinguis (Walker)

Ephydra pinguis Walker, 1852:409.
Parydra pinguis (Walker), Loew 1878:199.
Parydra pinguis Loew, Cresson 1949:244.
Napaea (*Napaea*) *pinguis* (Walker), Sturtevant and Wheeler 1954:224-225.

Type. — This species was described by Walker (1852) and the locality was listed as the United States. Loew (1878) redescribed *pinguis* placing it in the genus *Parydra* but he made no mention of seeing Walker's type. The senior author has been unable to locate Walker's type or type series but has examined the specimens that Loew apparently had before him when redescribing *pinguis*. Walker's description of *pinguis* includes: "head . . . covered with white down in front: . . . legs black with knees and shanks ferruginous". These characters should be sufficient to indicate that he was describing the same species as Loew. Loew's specimens at the Museum of Comparative Zoology, Harvard are as follows: 1 ♂ and 1 ♀ labeled D.C., Loew Coll. and 1 ♀ labeled Texas, Febr., Loew Coll.

Diagnosis. — Lateral scutellar tubercules absent; apical scutellar tubercules present; apical scutellar process absent; apex of scutellum rounded or

blunt; orbital setae long; facial pruinosity dense grey, white or silvery without apparent ground color; femora black except reddish apex; tibiae and tarsi reddish; and costal section of wing from R_1 to R_{2+3} 1.1 to 1.3 times distance from R_{2+3} to R_{4+5}.

Description: *MALE*. — Total body length 2.92 to 3.23 mm; shining black with golden and greyish pruinosity. *Head* shining black with golden pruinosity except where indicated; length 0.68 to 0.75 mm; ocellar triangle raised; 3 round ocelli; ocellar setae large, divergent; interocellar and postocellar setae small, divergent; 3 large pairs of orbital setae; eyes red, oval; 1 large pair of convergent, inner vertical setae; 1 large pair of divergent, exterior vertical setae; postorbitals and occipitals very small. Face shining black with dense grey, white or silvery pruinosity; no ground color apparent; convex when viewed in profile; facial depressions small; 1 large pair and 6 smaller pairs of parafacial setae. Clypeus with dense grey, white or silvery pruinosity; mouthparts with golden to somewhat greyish pruinosity. Antennae reddish to brown with golden pruinosity; arista reddish to brown, plumose.

Thorax shining black with golden pruinosity; no greyish spots at intrascutal suture; very faint greyish stripes laterally along dorsocentral setae, between dorsocentral and acrostichal setal rows, and medially between acrostichal setal rows; scutum length 0.92 to 0.99 mm; many long acrostichal and dorsocentral setae; 1 long pair of prescutellar setae; humeral and posthumeral setae long and fine; presuturals long and fine, usually 1 but sometimes 2 larger pairs; 2 large pairs of notopleurals, posterior pair larger; 1 large pair of posterior intraalar setae; pleura shining black with golden pruinosity above, becoming greyish below; 1 large pair of mesopleural setae; sternum with greyish pruinosity; katepisternal spine absent. Scutellum (Fig. 154) shining black with golden pruinosity, length 0.41 to 0.48 mm, apical process absent, apex rounded or blunt, apical tubercules present, apical scutellar setae large, lateral tubercules absent, lateral scutellar setae large. *Legs* black and reddish; coxa and all but apex of femora black, trochanters, apex of femora, tibiae and tarsi reddish; legs covered with golden and greyish pruinosity; prothoracic tibiae with long yellow setae at apex; mesothoracic tibiae each with a spur and 3 large, black anterior setae; apex of metathoracic tibiae with an anterior cluster of black setae and a reddish, posterior comb. *Wing* (Fig. 197) clouded, darkened areas around crossveins; no whitish spots; veins brown; branch vein at apex of R_{2+3} present or absent; length from humeral crossvein 2.14 to 2.31 mm; width 0.99 to 1.02 mm; distance from h to R_1 0.68 to 0.71 mm; R_1 to R_{2+3} 0.88 to 0.92 mm; R_{2+3} to R_{4+5} 0.65 to 0.75 mm; R_{4+5} to M_{1+2} 0.24 to 0.27 mm; length of R_{4+5} 1.22 to 1.33 mm; length of M_{1+2} 0.65 to 0.75 mm; costal section from R_1 to R_{2+3} 1.2 to 1.3 times distance from R_{2+3} to R_{4+5}; halteres yellow.

Abdomen as in Fig. 20 except where specified; shining black with golden pruinosity anteriorly becoming greyish posteriorly on tergites. Tergites 2 through 5 continuous dorsally or with fine lateral sutures; tergites 6, 7 and 8 absent. Sternite 4 somewhat variable, with an anterior projection or an

anterior notch, truncate to concave posteriorly. Sternite 5 with or without an anterior fragment. *Genitalia* as in Fig. 86. Note the paired gonites with rounded apices, fused to sternite 6 anteriorly and gonal arch posteriorly. Gonal arch narrow, without projections. Aedeagus boat-shaped, not fused to aedeagal apodeme.

FEMALE. — Total body length 3.09 to 3.64 mm. Head, thorax, legs and wings as in males except where noted.

Head length 0.78 to 0.92 mm; parafacial setae, 1 large pair and 5 to 8 smaller pairs.

Thorax with scutum length 1.09 to 1.12 mm; scutellum length 0.44 to 0.54 mm; presuturals, 1 long pair. *Wing* length from humeral crossvein, 2.58 to 2.72 mm; width 1.02 to 1.22 mm; distance from h to R_1 0.78 to 0.85 mm; R_1 to R_{2+3} 0.95 to 1.05 mm; R_{2+3} to R_{4+5} 0.82 to 0.88 mm; R_{4+5} to M_{1+2} 0.27 to 0.31 mm; length of R_{4+5} 1.39 to 1.50 mm; length of M_{1+2} 0.78 to 0.82 mm; costal section from R_1 to R_{2+3} 1.1 to 1.3 times distance from R_{2+3} to R_{4+5}.

Abdomen as in Fig. 54. Ventral receptacle as in Fig. 122.

Distribution. — Eastern half of the United States (Fig. 227).

Specimens examined. — 48 specimens (21 ♂♂ and 27 ♀♀) from District of Columbia, Florida, Georgia, Iowa, Kansas, Louisiana, Maryland, Mississippi, Missouri, New York, North Carolina, Pennsylvania, Texas, Virginia, and West Virginia. Collected from February to October.

Parydra (Parydra) quadrituberculata Loew

Parydra quadrituberculata Loew, 1862:165-166; Cresson 1949:249-250.
Napaea (*Parydra*) *quadrituberculata* (Loew), Sturtevant and Wheeler 1954: 228-229.

Types. — This species was described from a holotype ♀ and 3 or 4 ♀ paratypes. Loew (1862) indicated that he observed male specimens but none in Loew's collection were labeled "Middle States" but there is 1 ♂ and 1 ♀ bearing only the label "Osten Sacken Coll.". Cresson (1949) mentions the presence of the holotype ♀ and 4 paratopotypes but the senior author could find only 3 in the M.C.Z. collection. The holotype ♀ bears the labels Middle St., Loew Coll., and Type 11172. The paratype females bear the same labels except Type 2, 3 and 4; each with 11172 also. The holotype and paratypes are deposited in the Museum of Comparative Zoology, Harvard.

Diagnosis. — Lateral scutellar tubercules and apical scutellar tubercules

present, distance between apical scutellar tubercules distinctly less than their length, orbital setae short, and katepisternal spine present.

Description: *MALE.* — Total body length 3.64 to 3.84 mm; shining black with coppery, golden and greyish pruinosity. *Head* (Figs. 1, 3, 6 and 8) shining black with coppery pruinosity except as noted; length 0.88 mm; ocellar triangle raised; 3 round ocelli; ocellar setae large, divergent; interocellar and postocellar setae small, divergent; 2 or 3 small pairs and 4 to 6 very small pairs of orbital setae; eyes red, oval; vertex with coppery pruinosity above, becoming golden below; 1 small pair of convergent, inner vertical setae; 1 small pair of divergent, exterior vertical setae; postorbitals and occipitals very small; gena black with golden pruinosity. Face shining black with grey to white pruinosity; occasionally with some light yellow pruinosity; convex when viewed in profile; facial depressions small; 1 large pair and 3 or 4 smaller pairs of parafacial setae. Clypeus with grey to white pruinosity; mouthparts (Fig. 8) with greyish pruinosity. Antennae dark, brown to black with coppery pruinosity; arista black, bare or very slightly plumose.

Thorax (Figs. 2, 4 and 5) shining black with golden to coppery pruinosity; faint greyish stripes laterally along dorsocentral setae and between dorsocentral and acrostichal setal rows; stripe not apparent between acrostichal setal rows; no spot at intrascutal suture; scutum length 1.09 to 1.22 mm; many short acrostichal and dorsocentral setae; 1 long pair of prescutellar setae; humeral and posthumeral setae small and fine; presuturals short and fine; 2 large pairs of notopleurals, posterior pair larger; 1 large pair of posterior intraalar setae; pleura shining black with golden pruinosity above, becoming greyish below; mesopleural setae small; sternum with greyish pruinosity; katepisternal spine present (Fig. 5). Scutellum (Figs. 4, 5 and 155) shining black with golden pruinosity, length 0.48 to 0.51 mm, apical process absent, apical tubercules present and distance between them being less than their length, apical scutellar setae large, lateral tubercules present, lateral scutellar setae large. *Legs* (Fig. 9) black except trochanters, tibiae, and tarsi reddish; covered with greyish pruinosity; prothoracic tibiae with long yellow setae at apex; mesothoracic tibiae each with a spur and 3 large, black anterior setae at apex; apex of metathoracic tibiae with an anterior cluster of black setae and a yellow, posterior comb. *Wing* (Fig. 198) clear to very slightly clouded; no darkened areas around crossveins; no white spots; veins brown; length from humeral crossvein 2.99 to 3.33 mm; width 1.18 to 1.27 mm; distance from h to R_1 0.81 to 0.85 mm; R_1 to R_{2+3} 1.67 to 1.84 mm; R_{2+3} to R_{4+5} 0.54 to 0.68 mm; R_{4+5} to M_{1+2} 0.27 to 0.31 mm; length of R_{4+5} 1.80 to 2.07 mm; length M_{1+2} 1.19 to 1.43 mm; costal section from R_1 to R_{2+3} 2.5 to 3.1 times distance from R_{2+3} to R_{4+5}; halteres (Fig. 7) yellow.

Abdomen as in Fig. 21 except where mentioned; shining black with golden pruinosity, becoming greyish posteriorly on tergites. Tergites 2 through 5 continuous dorsally or with fine lateral sutures; tergites 6, 7 and 8 absent. Sternite 5 narrow and straplike or small and broadly elliptical. *Genitalia* as in Fig. 87. Note the short paired gonites with rounded but somewhat angular

apices, fused to lateral remnants of gonal arch posteriorly and connected to sternite 6 anteriorly. Gonal arch consisting of 2, triangular lateral fragments fused with gonites, not complete dorsally, connected to aedeagus at apex of fragments. Aedeagus boat-shaped, not fused to aedeagal apodeme.

FEMALE. — Total body length 4.15 to 4.59 mm. Head, thorax, legs and wings as in males except where specified.

Head length 0.88 to 1.02 mm; 2 to 4 small pairs and 3 to 5 very small pairs of orbital setae; 1 large pair and 3 to 6 smaller pairs of parafacial setae.

Thorax with scutum length 1.29 to 1.46 mm; scutellum length 0.58 to 0.61 mm. *Wing* length from humeral crossvein 3.23 to 4.15 mm; width 1.37 to 1.57 mm; distance from h to R_1 0.88 to 1.09 mm; R_1 to R_{2+3} 1.80 to 2.14 mm; R_{2+3} to R_{4+5} 0.68 to 0.71 mm; R_{4+5} to M_{1+2} 0.31 to 0.34 mm; length R_{4+5} 2.04 to 2.52 mm; length M_{1+2} 1.39 to 1.67 mm; costal section from R_1 to R_{2+3} 2.5 to 3.0 times distance from R_{2+3} to R_{4+5}.

Abdomen as in Fig. 55 except where mentioned. Sternite 2 sometimes with anterior notch and sternite 3 sometimes with small anterior process. Ventral receptacle as in Fig. 123.

Distribution. — Eastern half of the U.S. and Canada (Fig. 226).

Specimens examined. — 1,498 specimens (616 ♂♂ and 882 ♀♀) from Alabama, Connecticut, Delaware, District of Columbia, Florida, Illinois, Indiana, Iowa, Kansas, Louisiana, Maine, Maryland, Massachusetts, Michigan, Minnesota, Mississippi, Missouri, Montana, Nebraska, New Hampshire, New Jersey, New York, North Carolina, North Dakota, Ohio, Pennsylvania, South Dakota, Tennessee, Texas, Virginia, Wisconsin, Alberta, Manitoba, Ontario, Quebec, and Saskatchewan. This species is collected in every month but November.

Parydra (Parydra) transversa Cresson

Parydra transversa Cresson, 1940:10; Cresson, 1949:245.
Napaea transversa (Cresson), Sturtevant and Wheeler 1954:220.

Types. — This species was described from the holotype ♂ and 4 paratypes (listed by Cresson as 2 ♂♂ and 2 ♀♀ but actually 3 ♂♂ and 1 ♀) all in the collection of the Academy of Natural Sciences of Philadelphia, Pennsylvania. All of the types bear the following data: St. Petersburg, Florida; II.15.1924; (E. T. Cresson, Jr.). The holotype bears the type number 6601 but the type number indicated by Cresson (1940) was 6547.

Diagnosis. — Lateral scutellar tubercules absent; apical scutellar tubercules present; apical scutellar process absent and apex of scutellum appears

rounded or blunt; orbital setae long; facial pruinosity sparse, grey, white or silvery with apparent metallic ground color; femora black except apex reddish; tibiae reddish; and costal section of wing R_1 to R_{2+3} 0.9 to 1.1 times distance from R_{2+3} to R_{4+5}.

Description: *MALE.* — Total body length 3.13 to 3.57 mm; shining black with golden, coppery and greyish to silvery or white pruinosity. *Head* shining black with golden pruinosity except as mentioned; length 0.75 to 0.78 mm; ocellar triangle raised; 3 round ocelli; ocellar setae large, divergent; interocellar and postocellar setae small, divergent; 3 large pairs of orbital setae; eyes red, oval; vertex with coppery to golden pruinosity above, becoming lighter golden below; 1 large pair of convergent, inner vertical setae; 1 large pair of divergent, exterior vertical setae; postorbitals and occipitals small; gena shining black with golden pruinosity. Face shining black to reddish with metallic reflections; sparse grey, white or silvery pruinosity; convex when viewed in profile; facial depressions large, appearing as two, one small depression at base of antenna and a large transverse depression near first parafacial seta; 1 large pair and 3 to 5 smaller pairs of parafacial setae. Clypeus with dense grey, white or silvery pruinosity; little metallic ground color apparent; mouthparts with greyish pruinosity. Antennae brown to reddish with coppery pruinosity; arista brown to black, plumose.

Thorax shining black with golden to coppery pruinosity; faint greyish stripes laterally along dorsocentral setae and medially between acrostichal setal rows; faint greyish stripes more pronounced between dorsocentral and acrostichal setal rows, sometimes appearing as spots near posterior of thorax; no spot at intrascutal suture; scutum length 0.99 to 1.09 mm; many long acrostichal setae; many long dorsocentral setae with 1 larger pair at intrascutal suture; 1 long pair of prescutellar setae; humeral and posthumeral setae long and fine; presuturals long and fine, 1 larger pair; 2 large pairs of notopleurals, posterior pair larger; 1 large pair of posterior intraalar setae; pleura shining black with golden pruinosity above, becoming greyish below; 1 large pair of mesopleural setae; sternum with greyish pruinosity; katepisternal spine absent. Scutellum (Fig. 156) shining black with golden to coppery pruinosity; length 0.44 to 0.58 mm; apical process absent, apex appearing rounded or blunt; apical tubercules present; apical scutellar setae large; lateral tubercules absent; lateral scutellar setae large. *Legs* with coxae and all but apices of femora black to brown; trochanters, apices of femora, tibiae, and tarsi reddish; legs covered with greyish pruinosity; prothoracic tibiae with long reddish setae at apex; mesothoracic tibiae each with a spur and 3 large, black anterior setae at apex; apex of metathoracic tibiae with an anterior cluster of black setae and a yellow, posterior comb. *Wing* (Fig. 199) clouded, darkened areas around crossveins bounded by whitish spots, one whitish spot posterior to medial crossvein, one whitish spot at junction of R_{2+3} and R_{4+5}; veins brown; R_{2+3} sometimes appendiculate at apex; length from humeral crossvein 2.45 to 2.65 mm; width 1.09 to 1.19 mm; distance from h to R_1 0.75 to 0.82 mm; R_1 to R_{2+3} 0.82 to 0.99 mm; R_{2+3} to R_{4+5} 0.88 to 0.95 mm; R_{4+5} to M_{1+2} 0.31

to 0.37 mm; length R_{4+5} 1.43 to 1.53 mm; length M_{1+2} 0.78 to 0.85 mm; costal section from R_1 to R_{2+3} 0.9 to 1.1 times distance from R_{2+3} to R_{4+5}; halteres yellow.

Abdomen as in Fig. 22; shining black to brown with golden pruinosity, becoming greyish posteriorly and laterally on tergites. Tergites 2 through 5 continuous dorsally or with fine lateral sutures; tergites 6, 7 and 8 absent. *Genitalia* as in Fig. 88. Note the paired gonites with long, bluntly rounded apices, connected to sternite 6 anteriorly and the gonal arch posteriorly. Gonal arch composed of two fused, lateral, triangular plates; connected to aedeagus at apex. Accessory aedeagal sclerite present and U-shaped. Aedeagus composed of two lateral, triangular plates; connected to gonal arch dorsally and accessory aedeagal sclerite posteriorly; not fused to aedeagal apodeme.

FEMALE. — Total body length 3.60 to 4.01 mm. Head, thorax, legs and wings as in males except as noted.

Head length 0.82 to 0.85 mm; 1 large pair and 3 or 4 smaller pairs of parafacial setae.

Thorax with scutum length 1.19 to 1.26 mm; scutellum length 0.54 to 0.58 mm. *Wing* length from humeral crossvein 2.82 to 3.06 mm; width 1.26 to 1.29 mm; distance from h to R_1 0.88 mm; R_1 to R_{2+3} 1.05 to 1.09 mm; R_{2+3} to R_{4+5} 0.95 to 1.09 mm; R_{4+5} to M_{1+2} 0.34 to 0.41 mm; length R_{4+5} 1.60 to 1.80 mm; length M_{1+2} 0.85 to 0.95 mm; costal section from R_1 to R_{2+3} 1.0 to 1.1 times distance from R_{2+3} to R_{4+5}.

Abdomen as in Fig. 56. Ventral receptacle as in Fig. 124.

Distribution. — Florida (Fig. 225).

Specimens examined. — 23 specimens (10 ♂♂ and 13 ♀♀) with the following data: St. Petersburg, Florida, II.15.1924, (E. T. Cresson, Jr.), holotype ♂ and 4 paratypes (3 ♂♂ and 1 ♀); Tampa, Florida, 20 March 33, A. L. Melander, 1 ♂ and 2 ♀♀; Port St. Joe, Gulf County Beach, Florida, March 17, 1954, George Steyskal, 1 ♂ and 6 ♀♀; Flamingo, Florida, 26 Jan. 1939, A. L. Melander, 1 ♂; and 7 specimens from St. Augustine, Florida, C. W. Johnson Collection (2 ♂♂ and 1 ♀, IV.21.19), (1 ♂ and 1 ♀, IV.27.19), and (2 ♀♀, IV.16.19).

Parydra (Parydra) unituberculata Loew

Parydra unituberculata Loew, 1878:200; Cresson 1949:242.
Napaea (Napaea) unituberculata (Loew), Sturtevant and Wheeler 1954:226.

Types. — This species apparently was described from two female specimens. The holotype (type 11173) and the paratype? (type 2, 11173) both bear the labels D.C. and Loew Collection. These types are both deposited in the Museum of Comparative Zoology, Harvard.

Diagnosis. — Lateral scutellar tubercules absent; apical scutellar tubercules present; apical scutellar process present, short and broad, often knobbed; orbital setae long; wings without a crossvein joining R_{2+3} and R_{4+5}, R_{2+3} not appendiculate at apex; and tibiae black except small reddish areas at base and apex.

Description: *MALE.* — Total body length 2.92 to 4.08 mm; shining black with coppery, golden and greyish pruinosity. *Head* shining black with coppery pruinosity except where mentioned; length 0.78 to 0.85 mm; ocellar triangle raised; 3 round ocelli; ocellar setae large, divergent; interocellar and postocellar setae small, divergent; 2 large pairs and 1 or 2 small pairs of orbital setae; eyes red, oval; vertex with coppery pruinosity above, becoming golden below; 1 large pair of convergent, inner vertical setae; 1 large pair of divergent, exterior vertical setae; postorbitals and occipitals small; gena black with golden pruinosity. Face shining black with golden pruinosity; convex when viewed in profile; facial depressions divided into 2 pair, 1 small pair below antennae and 1 large, transverse pair near first parafacial setae; 1 large pair and 3 to 5 smaller pairs of parafacial setae. Clypeus with golden pruinosity; mouthparts with greyish pruinosity. Antennae dark, brown to black with golden pruinosity; arista black, plumose.

Thorax shining black with golden pruinosity; faint greyish spot at intrascutal suture; faint greyish stripes laterally along dorsocentral setae and between acrostichal and dorsocentral setal rows; sometimes faint, greyish stripe between acrostichal setal rows; scutum length 0.99 to 1.12 mm; many long acrostichal and dorsocentral setae; 1 long pair of prescutellar setae; humeral and posthumeral setae long and fine; presuturals long and fine, 1 pair larger; 2 large pairs of notopleurals, posterior pair larger; 1 large pair of posterior intraalar setae; pleura shining black with golden pruinosity above, becoming greyish below; 1 large pair of mesopleural setae; sternum with greyish pruinosity; katepisternal spine absent. Scutellum (Fig. 157) shining black with golden pruinosity; length 0.54 to 0.61 mm; apical process present, short and broad, often knobbed; apical tubercules present; apical scutellar setae large; lateral tubercules absent; lateral scutellar setae large. *Legs* black except base and apex of tibiae reddish, tarsi reddish; legs covered with greyish pruinosity; prothoracic tibiae with long yellow setae at apex; mesothoracic tibiae each with a spur and 3 large, black anterior setae at apex; apex of metathoracic tibiae each with 1 large black anterior seta and a yellow, posterior comb. *Wing* (Fig. 200) clouded, darkened areas around crossveins bounded by whitish spots, one such spot posterior to medial crossvein and one near middle of M_{1+2}; veins brown; length from humeral crossvein 2.55 to 2.82 mm; width 1.12 to 1.19 mm; distance from h to R_1 0.71 to 0.78 mm; R_1 to R_{2+3} 1.02 to 1.16 mm; R_{2+3} to R_{4+5} 0.82 to 0.85 mm; R_{4+5} to M_{1+2} 0.34 to 0.37 mm; length R_{4+5} 1.50 to 1.67 mm; length M_{1+2} 0.71 to 0.85 mm; costal section from R_1 to R_{2+3} 1.2 to 1.4 times distance from R_{2+3} to R_{4+5}; halteres yellow.

Abdomen as in Fig. 23 except where noted; shining black with grey pruinosity centrally and posteriorly on tergites, becoming golden laterally. Tergites

2 through 5 continuous dorsally or with fine lateral sutures; tergites 6, 7 and 8 absent. Sternites 2 through 4 with rounded or concave posterior margins; sternite 5 inverted U-shaped, sometimes with lobes and appearing to be a synsternite of 5 +. *Genitalia* as in Fig. 89. Note tergite 9 + surstyli with rounded apices. Paired gonites with rounded apices, fused to sternite 5 anteriorly and posteriorly to lateral remnants of gonal arch. Gonal arch not complete dorsally, 2 lateral fragments fused to gonites, lateral fragments with pointed ventral projections connected to aedeagus. Aedeagus boat-shaped, not fused to aedeagal apodeme.

FEMALE. — Total body length 3.88 to 4.08 mm. Head, thorax, legs and wings as in males except where indicated.

Head length 0.85 to 0.92 mm; 1 large pair and 2 to 5 smaller pairs of parafacial setae.

Thorax with scutum length 1.16 to 1.36 mm; scutellum length 0.71 to 0.75 mm. *Wing* length from humeral crossvein 3.06 to 3.33 mm; width 1.33 to 1.43 mm; distance from h to R_1 0.85 to 0.95 mm; R_1 to R_{2+3} 1.29 to 1.43 mm; R_{2+3} to R_{4+5} 0.88 to 1.05 mm; R_{4+5} to M_{1+2} 0.37 to 0.44 mm; length R_{4+5} 1.70 to 1.94 mm; length M_{1+2} 0.82 to 0.99 mm; costal section from R_1 to R_{2+3} 1.3 to 1.5 times distance from R_{2+3} to R_{4+5}.

Abdomen as in Fig. 57. Ventral receptacle as in Fig 125.

Distribution. — Eastern half of United States (Fig. 225).

Specimens examined. — 75 specimens (29 ♂♂ and 46 ♀♀) from Connecticut, Delaware, District of Columbia, Indiana, Louisiana, Maryland, Massachusetts, Mississippi, New Jersey, New York, North Carolina, Pennsylvania, South Carolina, Texas, Virginia, and West Virginia. Collected from March through November.

Parydra (Parydra) vanduzeei (Cresson)

Napaea vanduzeei Cresson, 1933:68-69.
Parydra vanduzeei (Cresson), 1949:241.
Napaea (*Napaea*) *vanduzeei* Cresson, Sturtevant and Wheeler 1954:226.

Types. — Cresson (1933 and 1949) lists the holotype ♀ from Niagara Falls, New York; July 21, 1913; M. C. Van Duzee; deposited in the collection of the Academy of Natural Sciences of Philadelphia; and two ♂ paratypes from East Aurora, New York; July 28, 1912; M. C. Van Duzee (no deposition site indicated). Cresson also indicates that the holotype and one paratype each have an additional crossvein in the wings. Sturtevant and Wheeler (1954) mention that they have seen one male paratype, "(California Academy of Sciences collection)", and on this basis included it in their key. From

this, one would assume that one or both male paratypes were at the California Academy of Sciences, but Dr. Paul H. Arnaud of the Academy assures us that neither of the paratypes is there.

Dr. Arnaud wrote letters to both Sturtevant and Wheeler to see if these paratypes are in their collection but such was not the case. Dr. M. R. Wheeler, after mentioning that the paratypes were not in his collection, wrote that his notes read "*Parydra vanduzeei* Cr. Paratype. keys to *unituberculata*."

The senior author has examined the female holotype and it is probably an aberrant specimen, at least with regard to wing venation and perhaps in other ways. The wings have a crossvein near the apex of R_{2+3} which joins R_{2+3} and R_{4+5}. Most characters seem to agree with those of *unituberculata* but the scutellar shape (especially the shape of the apical process), shape of the abdominal sternites (especially sternite 8), shape of the ventral receptacle, color of facial pruinosity, and of course the wing venation do not agree with those of *unituberculata*. Consequently, the senior author is hesitant in considering *vanduzeei* as being conspecific with *unituberculata*.

It is most unfortunate that the holotype is a female but it is even more regrettable that the male paratypes are apparently lost. An examination of the male genitalia would determine definitely the identity of the paratypes and give additional evidence of the probable identity of the holotype. However, in the absence of such evidence, we feel it best to consider *vanduzeei* as a distinct species, realizing that it is most certainly related to and may be ultimately found to be conspecific with *unituberculata*.

Diagnosis. — Lateral scutellar tubercules absent, apical scutellar process present and large, apical scutellar tubercules distinct, orbital setae long, face convex when viewed in profile, wings with a crossvein joining R_{2+3} and R_{4+5}.

Description: *MALE.* — unknown!

FEMALE. — Total body length 4.08 mm; shining black with golden, coppery and greyish pruinosity. *Head* shining black with golden pruinosity except where stated; length 0.82 mm; ocellar triangle raised; 3 round ocelli; ocellar setae large, divergent; interocellar and postocellar setae small, divergent; 2 large pairs of orbital setae; eyes red, oval; vertex with coppery pruinosity above, becoming golden below to whitish centrally; 1 large pair of convergent, inner vertical setae; 1 large pair of divergent, exterior vertical setae; postorbitals and occipitals small; gena black with greyish to golden pruinosity. Face shining black with grey pruinosity except golden between antennae; con-

vex when viewed in profile; facial depressions divided into 2 pair, 1 small pair below antennae and 1 small, transverse pair near first parafacial setae; 1 large pair and 4 smaller pairs of parafacial setae. Clypeus with grey pruinosity; mouthparts with greyish pruinosity. Antennae dark, brown to black with coppery pruinosity; arista black, plumose.

Thorax shining black with coppery pruinosity; spots and stripes not apparent; scutum length 1.29 mm; many long acrostichal setae; many long dorsocentral setae with 3 pair longer than others, 1 longer pair at intrascutal suture and 2 other pairs farther posterior; 1 long pair of prescutellar setae; humeral and posthumeral setae long and fine; presuturals long and fine, 1 pair larger; 2 large pairs of notopleurals, posterior pair larger; 1 large pair of posterior intraalar setae; pleura shining black with golden pruinosity above, becoming greyish below; 1 large pair of mesopleural setae; sternum with greyish pruinosity; katepisternal spine absent. Scutellum shining black with golden to coppery pruinosity; length 0.54 mm; apical process present, short and pointed; apical tubercules present; apical scutellar setae large; lateral tubercules absent; lateral scutellar setae large. *Legs* black except base and apex of tibiae reddish, tarsi reddish; legs covered with greyish pruinosity; apex of prothoracic tibiae with long setae; apex of mesothoracic tibiae each with a spur and 2 large, black anterior setae; apex of metathoracic tibiae each with 1 large, black anterior seta and a yellow, posterior comb. *Wing* clouded, darkened areas around crossveins bounded by white spots, one such spot posterior to medial crossvein and one near middle of M_{1+2}; veins brown; R_{2+3} with an appendage near apex, preceded by a crossvein which connects the R_{2+3} with R_{4+5}; length from humeral crossvein 2.99 mm; width 1.36 mm; distance from h to R_1 0.91 mm; R_1 to R_{2+3} 1.22 mm; R_{2+3} to R_{4+5} 0.88 mm; R_{4+5} to M_{1+2} 0.41 mm; length R_{4+5} 1.73 mm; length M_{1+2} 0.88; costal section from R_1 to R_{2+3} 1.5 times distance from R_{2+3} to R_{4+5}; halteres yellow but capitellum slightly darker than rest.

Abdomen as in Fig. 58; shining black with greyish pruinosity, becoming golden on lateral margins of tergites. Ventral receptacle as in Fig. 126.

Distribution. — Niagara Falls, New York (Fig. 233).

Specimens examined. — 1 specimen, the holotype female with data as listed under types.

Subgenus CHAETOAPNAEA Hendel

Chaetoapnaea Hendel, 1930:150. Type-species *Napaea pusilla* (Meigen), Hendel 1930:149-150. Cresson 1949:232; Sturtevant and Wheeler 1954:216. See generic synonomies!

Diagnosis. — Face straight to concave when head is viewed in profile; head setae large; scutellum usually lacking tubercules or an apical process; male genitalia usually with aedeagus and aedeagal apodeme fused, gonites usually pointed apically, gonal arch usually absent.

Description. — Generally small (1.43 to 4.28 mm long); shining black flies with golden, coppery and greyish pruinosity. *Head* with ocellar triangle raised; ocellar setae large, divergent; interocellar and postocellar setae small, divergent; orbital setae large; eyes red, oval; 1 large pair of convergent, inner vertical setae; 1 large pair of divergent, exterior vertical setae; postorbitals and occipitals small. Face straight to concave when head is viewed in profile; shining black with golden, coppery, greyish, or silvery pruinosity; facial depressions large and long, from antennal base to first parafacial seta; 1 large and several smaller pairs of parafacial setae.

Thorax: shining black with golden to coppery pruinosity, becoming greyish on lower areas of pleura; often with greyish stripes laterally along dorsocentral setal rows, between acrostichal and dorsocentral setal rows, and medially between acrostichal setal rows; often with a white to greyish spot at intrascutal suture; acrostichal and dorsocentral setae large, often several pairs of dorsocentrals are larger than others; 1 long pair of prescutellar setae; 2 large pairs of notopleural setae, posterior pair larger; 1 large pair of posterior intraalar setae; 1 large pair of mesopleural setae; sternum with greyish pruinosity; katepisternal spine absent. Scutellum shining black with golden to coppery pruinosity; apical process minute or absent; apical tubercules usually absent or very small; lateral tubercules absent; apical and lateral scutellar setae present and large. *Legs* black, or black and reddish with greyish pruinosity; apex of prothoracic tibiae with long setae; apex of mesothoracic tibiae variously setose, usually with a spur; apex of metathoracic tibiae variously setose anteriorly but with a posterior comb. *Wing* usually clouded with darkened areas around crossveins which usually are bounded by light or white spots; R_{2+3} often appendiculate near apex.

Abdomen as in generic description except as follows: Male genitalia usually with aedeagus and aedeagal apodeme fused; gonites usually pointed apically; and gonal arch usually absent.

Parydra (Chaetoapnaea) acuta n.sp.

Types. — Holotype ♂ from White River, Mt. Rainier, Washington, 28 Aug. '34, A. L. Melander. Paratype ♂ from Berkely Park, Mt. Rainier, Washington, 23 Aug. 1934, A. L. Melander. The holotype is deposited in the collection of the Academy of Natural Sciences of Philadelphia, and the paratype in that of the U.S. National Museum.

Diagnosis. — Tergites 3, 4 and 5 with anterior ventral areas rounded or somewhat angled; costal section of wing R_1 to R_{2+3} 0.6 to 0.8 times distance from R_{2+3} to R_{4+5}; and gonites long, narrow and pointed but not hooked at apex.

Description: *MALE.* — Total body length 2.21 to 2.65 mm; shining black with golden, coppery and greyish pruinosity. *Head* shining black with cop-

pery pruinosity except where stated; length 0.58 to 0.65 mm; ocellar triangle raised; 3 round ocelli; ocellar setae large, divergent; interocellar and postocellar setae small, divergent; 2 large pairs of orbital setae; eyes red, oval; vertex with coppery pruinosity above, becoming golden below; 1 large pair of convergent, inner vertical setae; 1 large pair of divergent, exterior vertical setae; postorbitals and occipitals small; gena black with golden pruinosity, ground color with metallic blue or green reflections. Face shining black with golden to greyish pruinosity, ground color with metallic blue reflections; straight to concave when viewed in profile; facial depressions long, from antennal base to first parafacial seta; 1 large pair and 3 or 4 smaller pairs of parafacial setae. Clypeus with golden pruinosity; mouthparts with greyish pruinosity. Antennae dark brown to black with coppery pruinosity; arista black, plumose.

Thorax shining black with golden to coppery pruinosity; faint greyish stripes between dorsocentral and acrostichal setal rows; greyish to white spot at intrascutal suture; scutum length 0.58 to 0.75 mm; many long acrostichal setae; many long dorsocentral setae with 1 pair larger at intrascutal suture; 1 long pair of prescutellar setae; humeral and posthumeral setae long and fine; presuturals long and fine, 1 pair larger; 2 large pairs of notopleurals, posterior pair larger; 1 large pair of posterior intraalar setae; pleura shining black with golden pruinosity above, becoming greyish below; 1 large pair of mesopleural setae; sternum with greyish pruinosity; katepisternal spine absent. Scutellum (Fig. 158) shining black with coppery pruinosity; length 0.24 to 0.34 mm; apical process small, pointed; apical and lateral tubercules absent; apical and lateral scutellar setae large. *Legs* black except trochanter and tarsi dark brown; legs with greyish pruinosity; prothoracic tibiae with long yellow setae at apex; mesothoracic tibiae each without a spur but with 1 or 2 large anterior setae at apex; apex of metathoracic tibiae with anterior cluster of brown setae and a brown, posterior comb. *Wing* (Fig. 201) clouded; darkened areas around crossvein bounded by white areas, sometimes appearing purplish; one white spot posterior to medial crossvein; no spot near middle of M_{1+2}; veins brown; length from humeral crossvein 1.70 to 2.04 mm; width 0.88 to 0.99 mm; distance from h to R_1 0.54 to 0.58 mm; R_1 to R_{2+3} 0.68 to 0.88 mm; R_{2+3} to R_{4+5} 0.51 to 0.58 mm; R_{4+5} to M_{1+2} 0.31 mm; length of R_{4+5} 1.02 to 1.29 mm; length of M_{1+2} 0.54 to 0.68 mm; costal section from R_1 to R_{2+3} 0.6 to 0.8 times distance from R_{2+3} to R_{4+5}; halteres brownish yellow.

Abdomen as in Fig. 24; shining black with golden pruinosity. Tergites 2 through 5 continuous dorsally or with fine lateral sutures; tergites 6, 7 and 8 absent. *Genitalia* as in Fig. 90. Note the long, pointed, paired gonites; fused to sternite 5 anteriorly. Gonal arch absent. Aedeagus long and pointed at apex, fused to aedeagal apodeme.

FEMALE. — Unknown!

Distribution. — Western Washington (Fig. 229).

Specimens examined. — 2 specimens (both ♂♂), the holotype and paratype with data as previously mentioned under types.

Parydra (Chaetoapnaea) appendiculata Loew

Parydra appendiculata Loew, 1878:202-203.
Napaea appendiculata (Loew), Cresson 1949:230-231.
Napaea (*Napaea*) *appendiculata* (Loew), Sturtevant and Wheeler 1954:222.

Type. — This species was described from a single female specimen bearing the labels Texas, Febr., Loew Coll., and Type 11167. This holotype ♀ is deposited in the Museum of Comparative Zoology, Harvard.

Diagnosis. — Costal section of wing from R_1 to R_{2+3} 1.4 to 1.7 times distance from R_{2+3} to R_{4+5}. *Male* with tergite 9 + surstyli rounded midventrally; gonites rounded apically; aedeagus with hooked apex and a large posterior opening. *Female* abdomen with sternite 5 round to oval; sternites 6, 7 and 8 subequal in width to other sternites; sternite 8 consisting of a single median sclerite without a posterior notch, convex posteriorly.

Description: *MALE.* — Total body length 2.24 to 2.48 mm; shining black with coppery, golden and greyish pruinosity. *Head* shining black with coppery pruinosity except as mentioned; length 0.47 to 0.54 mm; ocellar triangle raised; 3 round ocelli; ocellar setae large, divergent; interocellar and postocellar setae small, divergent; 2 large pairs of orbital setae; eyes red, oval; vertex with coppery pruinosity above, becoming golden below; 1 large pair of convergent, inner vertical setae; 1 large pair of divergent, exterior vertical setae; postorbitals and occipitals small; gena black with golden pruinosity. Face shining black with coppery pruinosity; straight to concave when viewed in profile; facial depressions long, from antennal base to first parafacial seta; 1 large pair and 4 or 5 smaller pairs of parafacial setae. Clypeus with coppery pruinosity; mouthparts with greyish pruinosity. Antennae dark brown to black with coppery pruinosity; arista black, plumose.

Thorax shining black with coppery pruinosity; faint greyish stripes laterally along dorsocentral setal rows and between acrostichal and dorsocentral setal rows; faint greyish spot at intrascutal suture; scutum length 0.54 to 0.65 mm; many long acrostichal setae; many long dorsocentral setae, 1 pair larger at intrascutal suture; 1 long pair of prescutellar setae; humeral and posthumeral setae long and fine; presuturals long and fine, 1 larger pair; 2 large pairs of notopleurals, posterior pair larger; 1 large pair of posterior intraalar setae; pleura shining black with golden pruinosity above, becoming greyish below; 1 large pair of mesopleural setae; sternum with greyish pruinosity; katepisternal spine absent. Scutellum (Fig. 159) shining black with coppery pruinosity; length 0.27 to 0.31 mm; apical process absent; apical and lateral tubercules absent; apical and lateral scutellar setae large. *Legs* black except trochanters and tarsi dark reddish; legs covered with greyish pruinosity; prothoracic tibiae with long yellow setae at apex; mesothoracic tibiae each with a spur and 3 large, black anterior setae at apex; apex of metathoracic tibiae with an anterior

cluster of black setae and a posterior comb. *Wing* (Fig. 202) clouded; darkened areas around crossveins bounded by faint whitish spots; one whitish spot posterior to medial crossvein; R_{2+3} usually appendiculate near apex and usually with a darkened area around the appendage or at apex of R_{2+3}, not bounded by whitish spots; veins brown; length from humeral crossvein 1.67 to 1.84 mm; width 0.75 to 0.78 mm; distance from h to R_1 0.48 to 0.54 mm; R_1 to R_{2+3} 0.71 to 0.78 mm; R_{2+3} to R_{4+5} 0.44 to 0.51 mm; R_{4+5} to M_{1+2} 0.20 to 0.24 mm; length R_{4+5} 0.99 to 1.09 mm; length M_{1+2} 0.58 to 0.61 mm; costal section from R_1 to R_{2+3} 1.4 to 1.7 times distance from R_{2+3} to R_{4+5}; halteres yellow.

Abdomen as in Fig. 25 except where noted; shining black with coppery pruinosity anteriorly, greyish posteriorly on tergites. Tergites 2 through 5 continuous dorsally or with fine lateral sutures; tergites 6, 7 and 8 absent. Sternite 2 somewhat variable, anterior "V" notch with a constriction near the anterior end or near middle, sometimes narrower at posterior, posterior rounded or truncate. *Genitalia* as in Fig. 91. Note the paired gonites with rounded apices, connected anteriorly to sternite 5. Gonal arch absent. Aedeagus with hooked apex, large posterior opening, fused at base to aedeagal apodeme.

FEMALE. — Total body length 2.35 to 3.16 mm. Head, thorax, legs and wings as in males except as indicated.

Head length 0.58 to 0.65 mm; 1 large pair and 4 to 6 smaller pairs of parafacial setae.

Thorax with scutum length 0.65 to 0.75 mm; scutellum length 0.27 to 0.34 mm. *Wing* length from humeral crossvein 1.94 to 2.21 mm; width 0.82 to 0.95 mm; distance from h to R_1 0.54 to 0.61 mm; R_1 to R_{2+3} 0.88 to 1.02 mm; R_{2+3} to R_{4+5} 0.54 to 0.65 mm; R_{4+5} to M_{1+2} 0.27 to 0.31 mm; length R_{4+5} 1.16 to 1.33 mm; length M_{1+2} 0.65 to 0.71 mm; costal section from R_1 to R_{2+3} 1.5 to 1.7 times distance from R_{2+3} to R_{4+5}.

Abdomen as in Fig. 59 except sternite 2 somewhat variable, anterior "V" notch, sometimes with constriction at middle of sclerite and narrower posteriorly, blunt to truncate posterior. Ventral receptacle as in Fig. 127.

Distribution. — Western Mexico, throughout U.S. except the southeast, and in Canada (Fig. 229).

Specimens examined. — 1,144 specimens (555 ♂♂ and 589 ♀♀) from Arizona, California, Colorado, Idaho, Illinois, Iowa, Kansas, Michigan, Minnesota, New Mexico, New York, Nevada, Oregon, Pennsylvania, South Dakota, Texas, Utah, Washington, Wisconsin, Wyoming, Baja California, Sonora, Labrador, Manitoba, Northwest Territory, Ontario, Quebec, Saskatchewan and Yukon. Collected all months of the year.

Parydra (Chaetoapnaea) arctica n. sp.

Types. — Holotype ♂ and 1 ♂ paratype from Canada, NWT,

Salmita Mines, 64°05′N., 111°15′W., both collected by J. G. Chillcot. The holotype was collected 16.VI.1953 and the paratype 12. VI.1953. Both deposited in the Canadian National Collection at Ottawa. In addition, there are 10 other paratypes. 1 ♂ and 2 ♀♀ from Cambridge Bay, NWT, Canada 18.VI.1950, E. H. N. Smith; 1 ♂ with same data but collected 7.VIII.1950; 1 ♂ and 1 ♀ from Coral Harbour, Southampton Is., NWT, Canada, P. R. Ehrlich, ♂ collected 10.VI.1952 and ♀ 17.VI.1952; 1 ♂ from Frobisher Bay, Baffin Island, Canada, 9.VIII.1948, F. G. Di Labio; and all are deposited in the Canadian National Collection at Ottawa. Two paratypes (1 ♂ and 1 ♀) are from Aklavik, NWT, Canada, May 18, 1931, Bryant, Lot 212, and the ♂ is deposited in the U.S. National Museum while the ♀ is deposited in the collection of the California Academy of Science at San Francisco. The remaining paratype ♂ is from Aklavik, NWT, Canada, Sept. 12, 1930, Bryant, Lot 142, and is deposited in the California Academy of Science Collection.

Diagnosis. — Costal section of wing from R_1 to R_{2+3} 1.6 to 2.3 times distance from R_{2+3} to R_{4+5}. *Male* with tergite 9 + surstyli rounded midventrally; gonites broad, flat, rounded or pointed apically; aedeagus with apex blunt and forked, large anterior opening, sometimes a small posterior opening, when viewed from the posterior the sides converge abruptly at base and slowly at apex. *Female* abdomen with sternite 8 consisting of a single median sclerite without a posterior notch, much wider than sternite 6 or 7; ventral receptacle with cap being about ½ total length of receptacle.

Description: *MALE.* — Total body length 2.58 to 2.72 mm; shining black with coppery, golden and greyish pruinosity. *Head* shining black with coppery pruinosity except where stated; length 0.58 to 0.61 mm; ocellar triangle raised; 3 round ocelli; ocellar setae large, divergent; interocellar and postocellar setae small, divergent; 2 large pairs and 2 or 3 small pairs of orbital setae; eyes red, oval; vertex with coppery pruinosity above, becoming greyish below; 1 large pair of convergent, inner vertical setae; 1 large pair of divergent, exterior vertical setae; postorbitals and occipitals small; gena black with golden pruinosity. Face shining black with golden pruinosity, straight to concave when viewed in profile; facial depressions long, from antennal base to first parafacial seta; 1 large pair and 3 smaller pairs of parafacial setae. Clypeus with golden pruinosity; mouthparts with greyish pruinosity. Antennae dark, brown to black with coppery pruinosity; arista black, slightly plumose.

Thorax shining black with golden to coppery pruinosity; faint greyish spot at intrascutal suture; faint greyish stripes between acrostichal and dorsocentral setal rows; scutum length 0.58 to 0.68 mm; many long acrostichal setae; many long dorsocentral setae with 2 pairs being larger than others, 1 pair at intra-

scutal suture and 1 pair further posterior; 1 long pair of prescutellar setae; humeral and posthumeral setae long and fine; presuturals long and fine, 1 larger pair; 2 large pairs of notopleurals, posterior pair larger; 1 large pair of posterior intraalar setae; pleura shining black with golden puinosity above, becoming greyish below; 1 large pair of mesopleural setae; sternum with greyish pruinosity; katepisternal spine absent. Scutellum (Fig. 160) shining black with coppery pruinosity, length 0.27 to 0.31 mm, apical process absent, apical and lateral tubercules absent, apical and lateral scutellar setae large. *Legs* all black or very dark brown with greyish pruinosity; prothoracic tibiae with long yellow setae at apex; mesothoracic tibiae each with 3 black anterior setae, no spur at apex; apex of metathoracic tibiae with 3 black anterior setae and a yellow posterior comb. *Wing* (Fig. 203) clouded, slightly darkened areas around crossveins; no white spots; veins dark brown to black; length from humeral crossvein 1.70 to 2.11 mm; width 0.78 to 0.88 mm; distance from h to R_1 0.48 to 0.51 mm; R_1 to R_{2+3} 0.75 to 1.02 mm; R_{2+3} to R_{4+5} 0.48 to 0.58 mm; R_{4+5} to M_{1+2} 0.24 mm; length R_{4+5} 1.02 to 1.29 mm; length M_{1+2} 0.61 to 0.78 mm; costal section from R_1 to R_{2+3} 1.6 to 1.9 times distance from R_{2+3} to R_{4+5}; halteres brown, slightly darker capitellum.

Abdomen as in Fig. 26; shining black with golden pruinosity anteriorly, becoming greyish posteriorly on tergites. Tergites 2 through 5 continuous dorsally or with fine lateral sutures; tergites 6, 7 and 8 absent. *Genitalia* as in Fig. 92. Note the paired gonites which may be broad, flat with posteriorly curved, pointed apices as in Fig. 92 or with rounded, slightly curved apices; connected to sternite 5 anteriorly. Gonal arch absent. Aedeagus with blunt, forked apex; large anterior opening; sometimes a small posterior opening; fused to aedeagal apodeme.

FEMALE. — Total body length 2.79 to 3.03 mm. Head, thorax, legs and wings as in males except where specified.

Head length 0.61 to 0.68 mm; 1 large pair and 3 or 4 small pairs of parafacial setae.

Thorax with scutum length 0.68 to 0.78 mm; scutellum length 0.27 to 0.31 mm. *Wing* length from humeral crossvein 1.87 to 2.17 mm; width 0.85 to 0.99 mm; distance from h to R_1 0.51 to 0.61 mm; R_1 to R_{2+3} 0.95 to 1.02 mm; R_{2+3} to R_{4+5} 0.44 to 0.58 mm; R_{4+5} to M_{1+2} 0.24 to 0.27 mm; length of R_{4+5} 1.09 to 1.36 mm; length of M_{1+2} 0.65 to 0.82 mm; costal section from R_1 to R_{2+3} 1.8 to 2.3 times distance from R_{2+3} to R_{4+5}.

Abdomen as in Fig. 60 except where mentioned. Sternites 7 and 8 somewhat variable; sternite 7 with or without an anterior notch, posterior truncate or with a deep notch; sternite 8 either with "V" shaped or "U" shaped, broad, anterior notch. Ventral receptacle as in Fig. 128.

Distribution. — Far northern North America (Fig. 229).

Specimens examined. — 12 specimens (8 ♂♂ and 4 ♀♀) including the holotype ♂ and 11 paratypes with data as listed previously for types.

Parydra (Chaetoapnaea) borealis (Cresson)

Napaea (*Chaetoapnaea*) *borealis* Cresson, 1949:235-236.
Napaea (*Napaea*) *borealis* (Cresson), Sturtevant and Wheeler 1954:223.

Types. — This species was described by Cresson from a holotype ♂, 5 paratypes (1 ♂ and 4 ♀ ♀), and 2 female specimens he considered to be conspecific with the types. The senior author has examined the holotype and one paratype (listed below). Cresson made no mention of where the paratypes were deposited. The senior author has observed specimens not bearing paratype labels but with identical data labels as the paratypes in question and these may or may not be the paratypes Cresson mentioned. The holotype ♂ bears the labels; Priest Lake, Idaho, 1 Aug. '16, A. L. Melander, Type, *Napaea borealis,* E. T. Cresson, Jr., and #1124. The paratype ♀ that has been observed has the labels Ilwaco, Washington, July 1917, A. L. Melander, and a paratype label. This paratype and the holotype are deposited in the collection of the Academy of Natural Sciences of Philadelphia.

Diagnosis. — Costal section of wing from R_1 to R_{2+3} 1.1 to 1.7 times distance from R_{2+3} to R_{4+5}. *Male* with tergite 9 + surstyli with or without a deep cleft; gonal arch absent; aedeagus not fused to aedeagal apodeme. *Female* abdomen with sternite 5 subtriangular, usually with an anterior notch; sternite 6, 7 and 8 subequal in width to other sternites; sternite 8 consisting only of a large median sclerite without a deep posterior notch, blunt to convex anteriorly, slight concavity on posterior lateral margins of each side; ventral receptacle with rounded cap, internal fold of cap not constricted near top, cap about 2/3 length of receptacle.

Description: *MALE.* — Total body length 2.75 to 3.23 mm; shining black with coppery and greyish pruinosity. *Head* shining black with coppery pruinosity except as specified; length 0.68 to 0.71 mm; ocellar triangle raised; 3 round ocelli; ocellar setae large, divergent; interocellar and postocellar setae small, divergent; 2 large pairs of orbital setae; eyes red, oval; vertex with coppery pruinosity above, becoming golden below; 1 large pair of convergent, inner vertical setae; 1 large pair of divergent, exterior vertical setae; postorbitals and occipitals small; gena black with coppery pruinosity. Face shining black with coppery, golden or greyish pruinosity, straight to concave when viewed in profile; facial depressions long, from antennal base to first parafacial setae; 1 large pair and 4 or 5 smaller pairs of parafacial setae. Clypeus with coppery, golden or greyish pruinosity; mouthparts with greyish pruinosity. Antennae dark, brown to black with coppery pruinosity; arista black, somewhat plumose.

Thorax shining black with coppery pruinosity; distinct white spot at intrascutal suture; faint greyish stripes, laterally along dorsocentral setal row, between dorsocentral and acrostichal setal rows, and medially between acrostichal setal rows; scutum length 0.71 to 0.85 mm; many long acrostichal setae; many long dorsocentral setae with 1 longer pair at intrascutal suture; 1 long pair of prescutellar setae; humeral and posthumeral setae long and fine; presuturals long and fine, 1 pair larger; 2 pairs of notopleurals, posterior pair larger; 1 large pair of posterior intraalar setae; pleura shining black with golden to coppery pruinosity above, becoming greyish below; 1 large pair of mesopleural setae; sternum with greyish pruinosity; katepisternal spine absent. Scutellum (Fig. 161) shining black with coppery pruinosity, length 0.31 to 0.41 mm, apical process absent, apical and lateral tubercules absent, apical and lateral scutellar setae large. *Legs* mostly black except trochanters reddish, sometimes apex of femur and base and apex of tibiae reddish, tarsi usually nearly black but sometimes dark reddish; legs covered with greyish pruinosity; prothoracic tibiae with long yellow setae at apex; apex of mesothoracic tibiae each with a spur and 3 black anterior setae; apex of metathoracic tibiae with an anterior cluster of black setae and a yellow posterior comb. *Wing* (Fig. 204) clouded, darkened areas around crossveins bounded by white spots; one white spot posterior to posterior crossvein; veins brown; length from humeral crossvein 2.14 to 2.52 mm; width 1.02 to 1.16 mm; distance from h to R_1 0.58 to 0.68 mm; R_1 to R_{2+3} 0.95 to 1.05 mm; R_{2+3} to R_{4+5} 0.61 to 0.82 mm; R_{4+5} to M_{1+2} 0.27 to 0.34 mm; length of R_{4+5} 1.26 to 1.43 mm; length of M_{1+2} 0.71 to 0.75 mm; costal section from R_1 to R_{2+3} 1.2 to 1.7 times distance from R_{2+3} to R_{4+5}; halteres yellow with brownish or greyish capitellum.

Abdomen as in Fig. 27 except where noted; shining black with golden to coppery pruinosity, becoming greyish on posterior lateral margins of tergites. Tergites 2 through 5 continuous dorsally or with fine lateral sutures; tergites 6, 7 and 8 absent. Sternite 1 absent or consisting of 2 small circular fragments. *Genitalia* as in Fig. 93. Tergite 9 + surstyli may be with a deep cleft as in Fig. 93 or without as in Fig. 94. Note (Fig. 93) the short, paired gonites with rounded apices, fused to sternite 5 anteriorly. Gonal arch absent. Aedeagus long with rounded apex, not fused to aedeagal apodeme.

FEMALE. — Total body length 3.33 to 3.94 mm. Head, thorax, legs and wings as in males except where indicated.

Head length 0.78 to 0.92 mm; 1 large pair and 4 to 6 smaller pairs of parafacial setae.

Thorax with scutum length 0.85 to 0.95 mm; scutellum length 0.37 to 0.48 mm. *Wing* length from humeral crossvein 2.21 to 2.92 mm; width 1.12 to 1.29 mm; distance from h to R_1 0.61 to 0.92 mm; R_1 to R_{2+3} 0.92 to 1.26 mm; R_{2+3} to R_{4+5} 0.65 to 0.92 mm; R_{4+5} to M_{1+2} 0.34 to 0.37 mm; length of R_{4+5} 1.26 to 1.70 mm; length of M_{1+2} 0.68 to 1.02 mm; costal section from R_1 to R_{2+3} 1.1 to 1.5 times distance from R_{2+3} to R_{4+5}.

Abdomen as in Fig. 61 except where mentioned. Sternite 1 very small,

short and wide, or absent. Sternites 3 and 5 sometimes with a small anterior notch. Ventral receptacle as in Fig. 129.

Distribution. — Pacific Northwest, northern U.S. and southern Canada (Fig. 234).

Specimens examined. — 15 specimens, (9 ♂♂ and 6 ♀♀) including the holotype and one paratype, with the following data: Holotype ♂, #1124, Priest Lake, Idaho, 1 Aug. '16, A. L. Melander; 1 paratype ♀, Ilwaco, Wash., July 1917, A. L. Melander; 1 ♀, Berkely Park, Mt. Rainier, Washington, 23 Aug. 1934, A. L. Melander; 1 ♀, Toledo, Washington, 27 June '35, A. L. Melander; 1 ♀, Corvallis, Oregon, May 10, 1936, N. P. Larson; 1 ♂, 10 mi. SE, Anchorage, Alaska, 8 IV 48, R. I. Sailer; 1 ♂, Isle Royale, Michigan, Aug. 3-7, 1936, C. Sabrosky; 1 ♂, Stinson Lake, White Mts., New Hampshire, 23 July 1961, W. W. Wirth; 1 ♂, Frankonia, New Hampshire, Mrs. Slosson; 2 ♂♂ and 1 ♀, Terrace, B. C., Canada, 2.VIII.1960, W. R. Richards; 1 ♂ and 1 ♀, Cypress Hills, Sask., Canada, 26.V.1955, J. R. Vockeroth; and 1 ♂, Thunder Bay, Quebec, Canada, 11.VI.1929, W. J. Brown.

Parydra (Chaetoapnaea) copis n. sp.

Types. — Holotype ♂ from Everett, Washington, 4 July 1924, A. L. Melander and 3 ♂ paratypes from the following localities; Adna, Wash., July 10, 1917, A. L. Melander; Lk. Crescent, Piedmont, Wash., July 26, 1917, A. L. Melander; and Vashon, Wash., May 28, 1917, A. L. Melander; all deposited in the collection of the Academy of Natural Sciences of Philadelphia. Also 2 ♂ paratypes from Lake Cushman, Wash., 22 July '17, A. L. Melander; and Marshfield, Oregon, 14 Sept. 34, A. L. Melander; both deposited in the U.S. National Museum.

Diagnosis. — Costal section of wing from R_1 to R_{2+3} 1.2 to 1.4 times distance from R_{2+3} to R_{4+5}; anterior-ventral areas of tergites rounded or somewhat angled, without finger-like processes; gonites long, narrow, pointed, tapering gradually and evenly from base to apex, not sharply curved at apex; aedeagus and aedeagal apodeme not fused; and aedeagus narrow when viewed from above, with a deep apical groove, knife or sheath-like in profile view.

Description: *MALE.* — Total body length 3.23 to 4.05 mm; shining black with coppery, golden, and greyish pruinosity. *Head* shining black with coppery pruinosity except where indicated; length 0.82 to 0.85 mm; ocellar triangle raised; 3 round ocelli; ocellar setae large, divergent; interocellar and

postocellar setae small, divergent; 2 large pairs of orbital setae; eyes red, oval; vertex with coppery pruinosity above, becoming golden below; 1 large pair of convergent, inner vertical setae; 1 large pair of divergent, exterior vertical setae; postorbitals and occipitals small; gena black with golden or coppery pruinosity, white or greyish below eye. Face shining black with coppery, golden and greyish pruinosity, straight to concave when viewed in profile; facial depressions long, from antennal base to first parafacial seta; 1 large pair and 4 to 6 smaller pairs of parafacial setae. Clypeus with golden, coppery, or greyish pruinosity; mouthparts with greyish pruinosity. Antennae dark, brown to black with coppery pruinosity; arista black, slightly plumose.

Thorax shining black with coppery pruinosity; distinct white spot at intrascutal suture; faint greyish stripe laterally along dorsocentral setal rows, between acrostichal and dorsocentral setal rows, and medially between acrostichal setal rows; scutum length 0.82 to 0.88 mm; many long acrostichal setae; many long dorsocentral setae with 1 pair larger at intrascutal suture; 1 long pair of prescutellar setae; humeral and posthumeral setae long and fine; presuturals long and fine, 1 larger pair; 2 large pairs of notopleurals, posterior pair larger; 1 large pair of posterior intraalar setae; pleura shining black with coppery to golden pruinosity above, becoming greyish below; 1 large pair of mesopleural setae; sternum with greyish pruinosity; katepisternal spine absent. Scutellum (Fig. 162) shining black with coppery pruinosity, length 0.48 to 0.51 mm, apical process absent, apical and lateral tubercules absent, apical and lateral scutellar setae large. *Legs* black except trochanters, base and apex of tibiae, and tarsi reddish; legs covered with greyish pruinosity; prothoracic tibiae with long yellow setae at apex; apex of mesothoracic tibiae each with a spur and 2 or 3 black anterior setae; apex of metathoracic tibiae with anterior cluster of black setae and yellow posterior comb. *Wing* (Fig. 205) clouded, darkened areas around crossveins bounded by white spots; one white spot posterior to posterior crossvein; vein R_{2+3} appendiculate near apex; veins brown; length from humeral crossvein 2.52 to 2.65 mm; width 1.19 to 1.29 mm; distance from h to R_1 0.68 to 0.75 mm; R_1 to R_{2+3} 1.02 to 1.12 mm; R_{2+3} to R_{4+5} 0.75 to 0.85 mm; R_{4+5} to M_{1+2} 0.34 to 0.37 mm; length of R_{4+5} 1.50 to 1.60 mm; length of M_{1+2} 0.71 to 0.78 mm; costal section from R_1 to R_{2+3} 1.2 to 1.4 times distance from R_{2+3} to R_{4+5}; halteres yellow.

Abdomen as in Fig. 28; shining black with golden pruinosity. Tergites 2 through 5 continuous dorsally or with fine lateral sutures; tergites 6, 7 and 8 absent. *Genitalia* as in Fig. 95. Note the long, narrow, pointed gonites fused anteriorly to sternite 5. Gonal arch absent. Aedeagus laterally compressed, knife or sheath-like in side view, fused to aedeagal apodeme.

FEMALE. — Unknown.

Distribution. — Coastal area of Pacific Northwest (Fig. 226).

Specimens examined. — 6 ♂ specimens including holotype and 5 paratypes. Localities as listed previously under types.

Parydra (Chaetoapnaea) halteralis (Cresson)

Males of this species can be divided into two groups on the basis of the shape of the aedeagus which, in one form, appears to be correlated with the locality from which it was collected. Consequently, the senior author has chosen to retain these two forms as subspecies of *P. halteralis*.

Diagnosis. — Costal section of wing from R_1 to R_{2+3} 1.6 to 2.1 times distance from R_{2+3} to R_{4+5}. *Male* with anterior-ventral areas of tergites 3, 4 and 5 rounded or somewhat angled, without finger-like processes; gonites long, narrow, pointed at apex, tapering gradually and evenly from base to apex, not sharply curved at apex; and aedeagus gouge-like in side view, narrow when viewed from above, having a deep apical groove. *Female* with sternite 8 consisting of a large, subtrapezoidal, median sclerite and one small, oval, lateral sclerite on each side; and ventral receptacle large, cap being about 1/9 the total length of abdomen.

Description: *MALE.* — Total body length 2.11 to 2.86 mm; shining black with coppery, brassy, golden, silvery, and greyish pruinosity. *Head* shining black with golden to brassy pruinosity except where mentioned; length 0.54 to 0.58 mm; ocellar triangle raised; 3 round ocelli; ocellar setae large, divergent; interocellar and postocellar setae small, divergent; 2 large pairs of orbital setae; eyes red, oval; vertex with coppery to brassy pruinosity above, becoming golden below; 1 large pair of convergent, inner vertical setae; 1 large pair of divergent, exterior vertical setae; postorbitals and occipitals small; gena black with golden to brassy pruinosity. Face shining black with silvery pruinosity; straight to concave when viewed in profile; facial depressions long, from antennal base to first parafacial seta; 1 large pair and 4 or 5 smaller pairs of parafacial setae. Clypeus with silvery pruinosity; mouthparts with greyish pruinosity. Antennae dark, brown to black with brassy pruinosity; arista black, somewhat plumose.

Thorax shining black with brassy to coppery pruinosity; faint greyish spot at intrascutal suture; faint greyish stripes laterally along dorsocentral setal row and between acrostichal and dorsocentral setal rows; no greyish stripe between acrostichal setal rows; scutum length 0.61 to 0.68 mm; many long acrostichal setae; many long dorsocentral setae with 2 pairs larger than others, 1 pair at intrascutal suture and 1 pair farther posterior; 1 long pair of prescutellar setae; humeral and posthumeral setae long and fine; presuturals long and fine, 1 larger pair; 2 large pairs of notopleurals, posterior pair larger; 1 large pair of posterior intraalar setae; pleura shining black with brassy pruinosity above becoming greyish below; 1 large pair of mesopleural setae; sternum with greyish pruinosity; katepisternal spine absent. Scutellum (Fig. 163) shining black with brassy pruinosity, length 0.24 to 0.34 mm, apical process absent, apical and lateral tubercules absent, apical and lateral scutellar setae large. *Legs* all black or dark brown with brassy and greyish pruinosity; prothoracic tibiae

with long yellow setae at apex; apex of mesothoracic tibiae each with a spur and 2 or 3 black anterior setae; apex of metathoracic tibiae with anterior cluster of yellow setae and yellow posterior comb. *Wing* (Fig. 206) slightly clouded, darkened areas around crossveins bounded by faint white spots; 1 faint white spot posterior to posterior crossvein; veins R_{2+3} and M_{1+2} bounded by darkened areas near apices; apex of R_{2+3} appendiculate; veins dark brown; length from humeral crossvein 2.07 to 2.41 mm; width 0.95 to 1.09 mm; distance from h to R_1 0.51 to 0.61 mm; R_1 to R_{2+3} 0.99 to 1.19 mm; R_{2+3} to R_{4+5} 0.54 to 0.61 mm; R_{4+5} to M_{1+2} 0.27 to 0.34 mm; length of R_{4+5} 1.26 to 1.43 mm; length of M_{1+2} 0.68 to 0.75 mm; costal section from R_1 to R_{2+3} 1.6 to 1.9 times distance from R_{2+3} to R_{4+5}; halteres dark brown.

Abdomen as in Fig. 30; shining black with brassy pruinosity. Tergites 2 through 5 continuous dorsally or with fine lateral sutures; tergites 6, 7 and 8 absent. *Genitalia* as in Figs. 96 or 97. Note the paired gonites with pointed apices, connected to sternite 5 anteriorly. Gonal arch absent. Aedeagus narrow and gouge-like, either tapering evenly to apex (Fig. 96) or becoming much wider near apex (Fig. 97), with deep apical groove, fused to aedeagal apodeme.

FEMALE. — Total body length 2.69 to 2.82 mm. Head, thorax, legs and wings as in males except where specified.

Head length 0.58 to 0.65 mm; 1 large pair and 3 to 5 smaller pairs of parafacial setae.

Thorax with scutum length 0.71 to 0.75 mm; scutellum length 0.31 to 0.34 mm. *Wing* with or without R_{2+3} being appendiculate; length from humeral crossvein 2.28 to 2.52 mm; width 0.99 to 1.09 mm; distance from h to R_1 0.61 to 0.65 mm; R_1 to R_{2+3} 1.12 to 1.26 mm; R_{2+3} to R_{4+5} 0.58 to 0.65 mm; R_{4+5} to M_{1+2} 0.27 to 0.34 mm; length of R_{4+5} 1.39 to 1.53 mm; length of M_{1+2} 0.75 to 0.85 mm; costal section from R_1 to R_{2+3} 1.7 to 2.1 times distance from R_{2+3} to R_{4+5}.

Abdomen as in Fig. 63 except where noted. Sternite 1 absent or consisting of 2 small, round fragments. Ventral receptacle as in Fig. 130.

Distribution. — Western United States (Fig. 226).

Parydra (Chaetoapnaea) halteralis halteralis (Cresson)

Napaea halteralis Cresson, 1930:81; Cresson 1949:230; Sturtevant and Wheeler 1954:220.

Types. — In the original description, Cresson mentions a holotype ♂; Type No. 6369 from Pullman, Washington; October 17, 1915; (A. L. Melander) and "two topotypical females collected May 12 and June 15, I consider to be paratypic with the type". The senior author has examined the holotype and the May 12 female mentioned by Cresson but this female bears an allotype label of which

Cresson makes no mention. The holotype and allotype are deposited in the collection of the Academy of Natural Sciences of Philadelphia and the whereabouts of the June 15 female is unknown.

Diagnosis. — This subspecies can be distinguished from *joaquinensis* by the slender aedeagus, thickened in the apical one-third; widely distributed in western United States.

Description: *MALE.* — As in the species description except total body length 2.11 to 2.69 mm.

Head length 0.54 mm.

Thorax with scutum length 0.61 to 0.68 mm; scutellum length 0.27 to 0.31 mm. *Wing* length from humeral crossvein 2.07 to 2.14 mm; width 0.99 mm; distance from h to R_1 0.51 to 0.58 mm; R_1 to R_{2+3} 0.99 mm; R_{2+3} to R_{4+5} 0.61 mm; R_{4+5} to M_{1+2} 0.27 mm; length of R_{4+5} 1.26 to 1.29 mm; length of M_{1+2} 0.71 mm; costal section from R_1 to R_{2+3} 1.6 times distance from R_{2+3} to R_{4+5}.

Abdomen with *Genitalia* as in Figs. 96 and 97 but aedeagus as in Fig. 97. Note the thickened portion of the aedeagus in its apical one-third.

FEMALE. — Total body length 2.75 to 2.82 mm; remainder as in males except where mentioned.

Head length 0.58 to 0.65 mm.

Thorax with scutum length 0.71 to 0.75 mm; scutellum length 0.31 to 0.34 mm. *Wing* length from humeral crossvein 2.28 to 2.38 mm; width 0.99 to 1.05 mm; distance from h to R_1 0.61 to 0.65 mm; R_1 to R_{2+3} 1.12 mm; R_{2+3} to R_{4+5} 0.58 to 0.65 mm; R_{4+5} to M_{1+2} 0.27 to 0.31 mm; length of R_{4+5} 1.39 to 1.43 mm; length of M_{1+2} 0.75 to 0.78 mm; costal section from R_1 to R_{2+3} 1.7 to 1.9 times distance from R_{2+3} to R_{4+5}.

Abdomen as in species description except sternite 1 always present, consisting of two, small, round fragments.

Distribution. — Western U.S. (Fig. 226).

Specimens examined. — 14 specimens (4 ♂♂ and 10 ♀♀) including the holotype ♂ and allotype with their data as mentioned previously under types. The data on the remaining 12 specimens are as follows: 2 ♂♂, Miller Can., Huachuca Mts., Arizona, 1.V.48, A. L. Melander; 1 ♀, Garden Vly., Eldorado Co., California, V.3. 1952, E. I. Schlinger; 1 ♀, Mammoth Lakes, California, VII.29. 1940, L. J. Lipovsky; 1 ♀, Tehachapi, California, 15 Mar. '35, Melander; 1 ♀, Moores Lake, Idaho, VI.10.07; 1 ♀, Moscow Mt., Idaho, 29 June 1918, A. L. Melander; 1 ♀, La R., Pyramid Lake, Nevada, March 28, 1952; 2 ♀♀, Tajique, New Mexico, VI.25.40, D. E. Hardy; 1 ♂, Sta. Catalina Mts., Arizona, May 25, 1937, Bryant, Lot 41; and 1 ♀ with the same data as holotype but without a collector.

Parydra (Chaetoapnaea) halteralis joaquinensis n. sub. sp.

Types. — Holotype ♂ and 3 paratypes (2 ♂ ♂ and 1 ♀) from San Joaquin Expt. Stat., Madera Co., California, II.22.53, P. D. Hurd. The holotype and 1 ♀ paratype deposited in the collection of the University of California, Berkeley, California and 2 ♂ paratypes deposited in the collection of the U.S. National Museum.

Diagnosis. — This subspecies is distinguishable from *halteralis* by the slender evenly shaped aedeagus, not thickened in the apical one-third; apparently confined to the San Joaquin Valley of California.

Description: *MALE.* — As in the species description except total body length 2.18 to 2.86 mm.

Head length 0.54 to 0.58 mm.

Thorax with scutum length 0.65 to 0.68 mm; scutellum length 0.24 to 0.34 mm. *Wing* length from humeral crossvein 2.11 to 2.41 mm; width 0.95 to 1.09 mm; distance from h to R_1 0.58 to 0.61 mm; R_1 to R_{2+3} 0.99 to 1.19 mm; R_{2+3} to R_{4+5} 0.54 to 0.61 mm; R_{4+5} to M_{1+2} 0.31 to 0.34 mm; length of R_{4+5} 1.29 to 1.43 mm; length of M_{1+2} 0.68 to 0.75 mm; costal section from R_1 to R_{2+3} 1.7 to 1.9 times distance from R_{2+3} to R_{4+5}.

Abdomen with *Genitalia* as in Fig. 96. Note the uniformly shaped aedeagus in its apical one-third, not thickened as in Fig. 97.

FEMALE. — Total body length 2.69 mm; remainder as in males except where stated.

Head length 0.61 mm.

Thorax with scutum length 0.75 mm; scutellum length 0.34 mm. *Wing* length from humeral crossvein 2.52 mm; width 1.09 mm; distance from h to R_1 0.61 mm; R_1 to R_{2+3} 1.26 mm; R_{2+3} to R_{4+5} 0.61 mm; R_{4+5} to M_{1+2} 0.34 mm; length of R_{4+5} 1.53 mm; length of M_{1+2} 0.85 mm; costal section from R_1 to R_{2+3} 2.1 times distance from R_{2+3} to R_{4+5}.

Abdomen as in species description except sternite 1 absent.

Distribution. — San Joaquin Valley of California.

Specimens examined. — 4 specimens (3 ♂ ♂ and 1 ♀) with data as listed for holotype and paratypes.

Parydra (Chaetoapnaea) hamata n. sp.

Types. — Holotype ♂ from Desert Edge, San Diego Co., California, Apr. 15, '18, M. C. Van Duzee, with "var." label, deposited in the collection of the Academy of Natural Sciences of Philadelphia. Also, 1 ♂ paratype from Deep Springs Lake, Inyo Co., California, III.9.1966, T. W. Fisher and R. E. Orth; and 1 ♀ paratype from

Temecula, Riverside Co., California, V.25.65, T. W. Fisher. Both paratypes are deposited in the collection of the University of California, Riverside, California.

Diagnosis. — Costal section of wing from R_1 to R_{2+3} 1.9 to 2.1 times distance from R_{2+3} to R_{4+5}. *Male* with tergite 9 + surstyli acutely angled midventrally; apex of gonites broad, flat and rounded; aedeagus blunt but with posterior, projecting hooks. *Female* abdomen with sternites 6, 7 and 8 subequal in width to other sternites; sternite 8 consisting only of a large median sclerite, without a posterior notch, blunt to convex anteriorly with a slight concavity on the posterior lateral margin of each side.

Description: *MALE.* — Total body length 3.64 to 3.84 mm; shining black with coppery, golden and greyish pruinosity. *Head* shining black with coppery pruinosity except where noted; length 0.78 mm; ocellar triangle raised; 3 round ocelli; ocellar setae large, divergent; interocellar and postocellar setae small, divergent; 2 large pairs of orbital setae; eyes red, oval; vertex with coppery pruinosity above, becoming golden below; 1 large pair of convergent, inner vertical setae; 1 large pair of divergent, exterior vertical setae; postorbitals and occipitals small; gena black with greyish pruinosity. Face shining black with coppery pruinosity, straight to concave when viewed in profile; facial depressions long, from antennal base to first parafacial seta; 1 large pair and 5 smaller pairs of parafacial setae. Clypeus with coppery pruinosity; mouthparts with greyish pruinosity. Antennae dark brown to black with coppery pruinosity; arista brown to black, slightly plumose.

Thorax shining black with coppery pruinosity; small, greyish to white spot at intrascutal suture; faint greyish stripes between acrostichal and dorsocentral setal rows; coppery stripe between acrostichal setal rows; scutum length 1.02 mm; many long acrostichal setae; many long dorsocentral setae with 2 pairs being larger than others, 1 pair at intrascutal suture and 1 pair farther posterior; 1 long pair of prescutellar setae; humeral and posthumeral setae long and fine; presuturals long and fine, 1 larger pair; 2 large pairs of notopleurals, posterior pair larger; 1 large pair of posterior intraalar setae; pleura shining black with coppery pruinosity above, becoming greyish below; 1 large pair of mesopleural setae; sternum with greyish pruinosity; katepisternal spine absent. Scutellum (Fig. 164) shining black with coppery pruinosity; length 0.37 to 0.48 mm; apical process small, appearing as a small bump or point; apical tubercules small, if present; lateral tubercules absent; apical and lateral scutellar setae large. *Legs* mostly black except trochanter, apex of femur, apex and base of tibiae, and tarsi reddish; legs covered with greyish pruinosity; prothoracic tibiae with long reddish setae at apex; mesothoracic tibiae each with a large spur and 4 black anterior setae at apex; apex of metathoracic tibiae with 3 black anterior setae and a yellow posterior comb. *Wing* (Fig. 207) clear, slightly darkened areas around crossveins; no white spots; R_{2+3} with or without appendage near apex; veins brown; length from humeral crossvein 2.86 to 3.06 mm; width 1.19 to 1.29 mm; distance

from h to R_1 0.82 to 0.85 mm; R_1 to R_{2+3} 1.43 to 1.56 mm; R_{2+3} to R_{4+5} 0.68 to 0.82 mm; R_{4+5} to M_{1+2} 0.37 to 0.41 mm; length of R_{4+5} 1.67 to 1.84 mm; length of M_{1+2} 0.95 to 0.99 mm; costal section from R_1 to R_{2+3} 1.9 to 2.1 times distance from R_{2+3} to R_{4+5}; halteres yellow.

Abdomen as in Fig. 29; shining black with golden pruinosity. Tergites 2 through 5 continuous dorsally or with fine lateral sutures; tergites 6, 7 and 8 absent. *Genitalia* as in Fig. 98. Note the paired gonites with broad, flat, rounded apices; connected to sternite 5 anteriorly. Gonal arch absent. Aedeagus blunt, with posteriorly projecting hooks, fused to aedeagal apodeme.

FEMALE. — Total body length 3.91 mm. Head, thorax, legs and wings as in males except where specified.

Head length 0.92 mm.

Thorax with scutum length 1.09 mm; scutellum length 0.54 mm. *Wing* length from humeral crossvein 3.13 mm; width 1.33 mm; distance from h to R_1 0.85 mm; R_1 to R_{2+3} 1.67 mm; R_{2+3} to R_{4+5} 0.82 mm; R_{4+5} to M_{1+2} 0.37 mm; length of R_{4+5} 1.90 mm; length of M_{1+2} 1.09 mm; costal section from R_1 to R_{2+3} 2.0 times distance from R_{2+3} to R_{4+5}.

Abdomen as in Fig. 62. Ventral receptacle as in Fig. 131.

Distribution. — Extreme southwestern U.S. (Fig. 230).

Specimens examined. — 3 specimens (2 ♂♂ and 1 ♀), the holotype ♂ and two paratypes, with data as listed under types.

Parydra (Chaetoapnaea) lingulata n. sp.

Types. — Holotype ♂ and 29 paratypes (14 ♂♂ and 15 ♀♀) from Emerald Lake, Gunnison Co., Colorado, VIII.27.1961, D. L. Deonier, in wet meadow. The holotype and 29 paratypes are deposited in the collection of Iowa State University, Ames, Iowa.

Diagnosis. — Costal section of wing from R_1 to R_{2+3} 1.7 to 2.1 times distance from R_{2+3} to R_{4+5}. *Males* with anterior-ventral areas of tergites 3, 4 and 5 rounded or somewhat angled, without finger-like processes; gonites long, narrow, pointed, tapering gradually and evenly from base to apex, not hooked or sharply curved at apex; aedeagus broad and flat when viewed from above, having a shallow apical groove. *Female* abdomen with sternite 8 consisting of a large, trapezoidal (not triangular), median sclerite and one, small, oval, lateral sclerite on each side; ventral receptacle small, cap about 1/14 length of abdomen.

Description: *MALE.* — Total body length 2.24 to 2.38 mm; shining black with coppery, golden, and greyish pruinosity. *Head* shining black with coppery pruinosity except as indicated; length 0.51 mm; ocellar triangle raised; 3 round ocelli; ocellar setae large, divergent; interocellar and postocellar setae small, divergent; 2 large pairs of orbital setae; eyes red, oval; vertex with coppery pruinosity above and below; 1 large pair of convergent, inner vertical

setae; 1 large pair of divergent, exterior vertical setae; postorbitals and occipitals small; gena black with golden pruinosity. Face shining black with greyish pruinosity, appearing somewhat brassy; face straight to concave when viewed in profile; facial depressions long, from antennal base to first parafacial seta; 1 large pair and 5 smaller pairs of parafacial setae. Clypeus with greyish pruinosity, appearing somewhat brassy; mouthparts with greyish pruinosity. Antennae dark brown to black with coppery pruinosity; arista black, somewhat plumose.

Thorax shining black with coppery pruinosity; no white spot at intrascutal suture; very faint greyish stripes laterally along dorsocentral setal rows, and between acrostichal and dorsocentral setal rows; scutum length 0.51 to 0.55 mm; many long acrostichal setae; many long dorsocentral setae, 1 larger at intrascutal suture; 1 long pair of prescutellar setae; humeral and posthumeral setae long and fine; presuturals long and fine, 1 larger pair; 2 large pairs of notopleurals, posterior pair larger; 1 large pair of posterior intraalar setae; pleura shining black with light golden, almost greyish, pruinosity; 1 large pair of mesopleural setae; sternum with light golden, almost greyish, pruinosity; katepisternal spine absent. Scutellum (Fig. 165) shining black with coppery pruinosity, length 0.24 to 0.27 mm, apical process absent, apical and lateral tubercules absent, apical and lateral scutellar setae large. *Legs* all black with greyish pruinosity; prothoracic tibiae with long yellow setae at apex; mesothoracic tibiae each with a spur and 3 black anterior setae at apex; apex of metathoracic tibiae with anterior cluster of black setae and a yellow posterior comb. *Wing* (Fig. 208) lightly clouded, darkened areas around crossveins bounded by very faint whitish spots; veins dark brown; length from humeral crossvein 1.73 to 1.80 mm; width 0.85 to 0.88 mm; distance from h to R_1 0.41 to 0.44 mm; R_1 to R_{2+3} 0.85 to 0.92 mm; R_{2+3} to R_{4+5} 0.44 to 0.51 mm; R_{4+5} to M_{1+2} 0.24 to 0.27 mm; length of R_{4+5} 1.05 to 1.09 mm; length of M_{1+2} 0.65 mm; costal section from R_1 to R_{2+3} 1.7 to 2.1 times distance from R_{2+3} to R_{4+5}; halteres dark brown.

Abdomen as in Fig. 31; shining black with light golden to greyish pruinosity. Tergites 2 through 5 continuous dorsally or with fine lateral sutures; tergites 6, 7 and 8 absent. *Genitalia* as in Fig. 99. Note paired gonites with pointed apices, connected to sternite 5 anteriorly. Gonal arch absent. Aedeagus broad and flat with shallow apical notch or groove, fused to aedeagal apodeme.

FEMALE. — Total body length 2.45 to 2.89 mm. Head, thorax, legs and wings as in males except as noted.

Head length 0.54 to 0.61 mm; 1 large pair and 4 smaller pairs of parafacial setae.

Thorax with scutum length 0.58 to 0.65 mm; scutellum length 0.24 to 0.27 mm. *Wing* length from humeral crossvein 1.80 to 1.94 mm; width 0.75 to 0.92 mm; distance from h to R_1 0.44 to 0.51 mm; R_1 to R_{2+3} 0.92 mm; R_{2+3} to R_{4+5} 0.44 to 0.51 mm; R_{4+5} to M_{1+2} 0.24 to 0.27 mm; length of R_{4+5} 1.09 to 1.12 mm; length of M_{1+2} 0.65 to 0.68 mm; costal section from

R_1 to R_{2+3} 1.8 to 2.1 times distance from R_{2+3} to R_{4+5}.

Abdomen as in Fig. 64 except sternite 1 may be absent or consist of two, small, oval fragments. Ventral receptacle as in Fig. 132.

Distribution. — Southwestern U.S. (Fig. 226).

Specimens examined. — 34 specimens (15 ♂♂ and 19 ♀♀), including the holotype ♂ and 29 paratypes with data as listed under types. The 4 remaining females have the following data: Deadman Pass, 10856′, California, 25.6.53, A. L. Melander; Harry Creek, Marshall Pass, Colorado, 9000′-10850′, 16-18 Sept. '17; Marshall Pass, Colorado, July 28, '08, J. M. A., IVG_2; and Ruidoso, New Mexico, VI.26.1940, L. C. Kuiteri.

Parydra (Chaetoapnaea) parasocia n. sp.

Types. — Holotype ♂ and 44 paratypes (34 ♂♂ and 10 ♀♀) from Sidney, Iowa, May 2, 1946, D. E. Hardy. All types deposited in the collection of Iowa State University, Ames, Iowa.

Diagnosis. — Costal section of wing from R_1 to R_{2+3} 1.2 to 1.4 times distance from R_{2+3} to R_{4+5}; metatibiae each with 1 or 2 very large spines on anteroventral apex, one of which extends beyond apex of tibia. *Male* with anterior-ventral areas of tergites 3, 4 and 5 rounded or somewhat angled, without finger-like processes; gonites long, narrow, pointed, tapering unevenly, taper in basal half more abrupt, distal half thus very long and slender, not hooked or sharply curved at apex; aedeagus with large, flat, keeled apex. *Female* with subtriangular sternite 5; sternites 6, 7 and 8 subequal in width to other sternites; sternite 8 consisting only of a large median sclerite without posterior notch, with a slight concavity on the posterior lateral margins of each side; rounded cap of ventral receptacle with the internal fold constricted near top, cap about 3/4 length of receptacle.

Description: *MALE.* — Total body length 2.65 to 2.96 mm; shining black with golden and greyish pruinosity. *Head* shining black with golden pruinosity except where specified; length 0.61 to 0.75 mm; ocellar triangle raised; 3 round ocelli; ocellar setae large, divergent; interocellar and postocellar setae small, divergent; 2 large pairs of orbital setae; eyes red, oval; vertex with golden pruinosity above and below; 1 large pair of convergent, inner vertical setae; 1 large pair of divergent, exterior vertical setae; postorbitals and occipitals small; gena black with greyish pruinosity. Face shining black with golden pruinosity, straight to concave when viewed in profile; facial depressions long, from antennal base to first parafacial seta; 1 large pair and 4 or 5 smaller pairs of parafacial setae. Clypeus with golden pruinosity; mouthparts with greyish pruinosity. Antennae dark, brown to black with coppery pruinosity; arista black, somewhat plumose.

Thorax shining black with golden pruinosity; no greyish spot at intrascutal suture; very faint greyish stripes laterally along dorsocentral setal rows, and between dorsocentral and acrostichal setal rows; scutum length 0.71 to 0.75 mm; many long acrostichal setae; many long dorsocentral setae, 2 pairs larger than others, 1 pair at intrascutal suture and 1 pair farther posterior; 1 long pair of prescutellar setae; humeral and posthumeral setae long and fine; presuturals long and fine, 1 larger pair; 2 large pairs of notopleurals, posterior pair larger; 1 large pair of posterior intraalar setae; pleura shining black with golden pruinosity above, becoming greyish below; 1 large pair of mesopleural setae; sternum with greyish pruinosity; katepisternal spine absent. Scutellum (Fig. 166) shining black with golden pruinosity; length 0.31 to 0.34 mm; apical process very small, appearing as a small bump; apical and lateral tubercules absent; apical and lateral scutellar setae large. *Legs* mostly black except apex of coxa, trochanter and apex and base of tibia reddish; tarsi yellowish to reddish; legs covered with greyish pruinosity; prothoracic tibiae with long yellow setae at apex; mesothoracic tibiae each with a spur and 3 black anterior setae at apex; apex of metathoracic tibiae each with 1 or 2 large black anterior setae, one of which extends beyond apex (Fig. 183), and a yellow posterior comb. *Wing* (Fig. 209) clear to very lightly clouded, slightly darkened areas around crossveins, sometimes bounded by faint whitish spots; R_{2+3} usually without an appendage at apex; veins dark brown; length from humeral crossvein 2.07 to 2.41 mm; width 0.95 to 1.09 mm; distance from h to R_1 0.65 to 0.68 mm; R_1 to R_{2+3} 0.95 to 1.02 mm; R_{2+3} to R_{4+5} 0.68 to 0.85 mm; R_{4+5} to M_{1+2} 0.27 to 0.34 mm; length of R_{4+5} 1.39 to 1.53 mm; length of M_{1+2} 0.78 to 0.85 mm; costal section from R_1 to R_{2+3} 1.2 to 1.4 times distance from R_{2+3} to R_{4+5}; halteres yellow to light brown.

Abdomen as in Fig. 32; shining black with golden pruinosity. Tergites 2 through 5 continuous dorsally or with fine lateral sutures; tergites 6, 7 and 8 absent. *Genitalia* as in Fig. 100. Note paired gonites which are long, narrow, pointed and taper more abrupt in basal half; connected to sternite 5 anteriorly. Gonal arch absent. Aedeagus with large, keeled apex, fused to aedeagal apodeme.

FEMALE. — Total body length 3.03 to 3.23 mm. Head, thorax, legs and wings as in males except where mentioned.

Head length 0.65 to 0.71 mm.

Thorax with scutum length 0.75 to 0.85 mm; scutellum length 0.31 to 0.34 mm. *Wing* length from humeral crossvein 2.41 to 2.58 mm; width 0.99 to 1.12 mm; distance from h to R_1 0.68 to 0.75 mm; R_1 to R_{2+3} 1.02 to 1.09 mm; R_{2+3} to R_{4+5} 0.71 to 0.82 mm; R_{4+5} to M_{1+2} 0.27 to 0.31 mm; length of R_{4+5} 1.39 to 1.56 mm; length of M_{1+2} 0.82 to 0.88 mm; costal section from R_1 to R_{2+3} 1.3 to 1.4 times distance from R_{2+3} to R_{4+5}.

Abdomen as in Fig. 65. Ventral receptacle as in Fig. 133.

Distribution. — Northern North America (Fig. 230).

Specimens examined. — 410 specimens (185 ♂♂ and 255 ♀♀),

including the holotype ♂ and 44 paratypes, collected from Alaska, California, Colorado, Idaho, Indiana, Iowa, Kansas, Michigan, Minnesota, Montana, Nebraska, Nevada, North Dakota, Oregon, South Dakota, Utah, Washington, Wisconsin, Alberta, British Columbia, Manitoba, Northwest Territory, Nova Scotia, Ontario, Quebec, and Saskatchewan. Collected every month from February through November except March.

Parydra (Chaetoapnaea) paullula Loew

Parydra paullula Loew, 1862:167-168; Coquillett 1900:462.
Napaea (*Chaetoapnaea*) *paullula* (Loew), Cresson 1949:232-233.
Napaea (*Napaea*) *paullula* (Loew), Sturtevant and Wheeler 1954:224; Dahl 1961:39.

Type. — Loew, in the original description of *P. paullula,* mentions only a ♀ with no locality. Cresson (1949) mentions that the type appears to be an immature male, not a female, and is labeled "Middle States". The senior author's examination of the type confirms Cresson's belief that the specimen is a male. The type which is teneral, bears the data Middle St., Type 11171, Loew Coll., and is deposited in the collection of the Museum of Comparative Zoology, Harvard.

Diagnosis. — Costal section of wing from R_1 to R_{2+3} 1.0 to 1.3 times distance from R_{2+3} to R_{4+5}. *Male* with tergites 3, 4 and 5 having the anterior-ventral areas elongated into finger-like processes; tergite 9 + surstyli rounded or curving slightly towards the midventral line; gonites long, narrow, and pointed, not hooked; aedeagus "S" shaped with rounded hook at tip. *Female* abdomen with sternite 8 consisting of a large median sclerite and one small lateral sclerite on each side.

Description: MALE. — Total body length 1.43 to 2.11 mm; shining black with coppery and greyish pruinosity. *Head* shining black with coppery pruinosity except as specified; length 0.44 to 0.48 mm; ocellar triangle raised; 3 round ocelli; ocellar setae large, divergent; interocellar and postocellar setae small, divergent; 2 large pairs of orbital setae; eyes red, oval; vertex with coppery pruinosity above, becoming golden below; 1 large pair of convergent, inner vertical setae; 1 large pair of divergent, exterior vertical setae; postorbitals and occipitals small; gena black with greyish pruinosity. Face shining black with greyish pruinosity above, becoming golden below; straight to concave when viewed in profile; facial depressions long, from antennal base to first parafacial seta; 1 large pair and 3 or 4 smaller pairs of parafacial setae. Clypeus with golden pruinosity; mouthparts with greyish pruinosity. Antennae dark, brown to black with coppery pruinosity; arista black, slightly plumose.

Thorax shining black with coppery pruinosity, without faint greyish stripes or spots; scutum length 0.44 to 0.54 mm; many long acrostichal setae; many long dorsocentral setae with 2 pairs being larger than others, 1 pair at intrascutal suture and 1 pair farther posterior; 1 long pair of prescutellar setae; humeral and posthumeral setae long and fine; presuturals long and fine, 1 larger pair; 2 large pairs of notopleurals, posterior pair larger; 1 large pair of posterior intraalar setae; pleura shining black with golden to coppery pruinosity above, becoming greyish below; 2 large pairs of mesopleural setae, upper pair largest; sternum with greyish pruinosity; katepisternal spine absent. Scutellum (Fig. 167) shining black with coppery pruinosity, length 0.17 to 0.20 mm, apical process absent, apical and lateral tubercules absent, apical and lateral scutellar setae large. *Legs* entirely dark brown to black with greyish pruinosity; prothoracic tibiae with long yellow setae at apex; mesothoracic tibiae each with a spur and 2 or 3 black anterior setae at apex; apex of metathoracic tibiae with a cluster of black anterior setae and a yellow posterior comb. *Wing* (Fig. 210) lightly clouded, slightly darkened areas around crossveins bounded by clear to whitish spots, no spot posterior to posterior crossvein; veins dark brown; length from humeral crossvein 1.46 to 1.70 mm; width 0.58 to 0.82 mm; distance from h to R_1 0.34 to 0.37 mm; R_1 to R_{2+3} 0.51 to 0.68 mm; R_{2+3} to R_{4+5} 0.51 to 0.58 mm; R_{4+5} to M_{1+2} 0.20 to 0.27 mm; length of R_{4+5} 0.85 to 1.02 mm; length of M_{1+2} 0.48 to 0.65 mm; costal section from R_1 to R_{2+3} 1.0 to 1.3 times distance from R_{2+3} to R_{4+5}; halteres dark brown.

Abdomen as in Fig. 33 except where indicated, shining black with greyish pruinosity. Tergites 2 through 5 continuous dorsally or with fine lateral sutures; tergites 6, 7 and 8 absent. Sternite 1 absent or consisting of 2 small, round fragments. *Genitalia* as in Fig. 101. Note the long, narrow, paired gonites with pointed apices; connected to sternite 5 anteriorly. Gonal arch absent. Aedeagus "S" shaped with a rounded, hooked tip; fused to aedeagal apodeme.

FEMALE. — Total body length 1.90 to 2.28 mm. Head, thorax, legs and wings as in males except where noted.

Head length 0.48 to 0.51 mm.

Thorax with scutum length 0.48 to 0.54 mm; scutellum length 0.20 to 0.24 mm. *Wing* length from humeral crossvein 1.53 to 1.90 mm; width 0.68 to 0.88 mm; distance from h to R_1 0.37 to 0.44 mm; R_1 to R_{2+3} 0.58 to 0.82 mm; R_{2+3} to R_{4+5} 0.58 to 0.65 mm; R_{4+5} to M_{1+2} 0.24 mm; length of R_{4+5} 0.88 to 1.19 mm; length of M_{1+2} 0.51 to 0.71 mm; costal section from R_1 to R_{2+3} 1.0 to 1.3 times distance from R_{2+3} to R_{4+5}.

Abdomen as in Fig. 66. Ventral receptacle as in Fig. 134.

Distribution. — Northern North America (Fig. 233).

Specimens examined. — 54 specimens (28 ♂♂ and 26 ♀♀) including the holotype ♂, from Alaska, Connecticut, Iowa, Massachusetts, Michigan, Minnesota, New Jersey, New York, Pennsylvania,

Wisconsin, British Columbia, Manitoba, Northwest Territory, Ontario, and Quebec. Collected from March through October.

Parydra (Chaetoapnaea) pedalis n. sp.

Types. — Holotype ♂ and 1 paratype ♂ from Canada, B.C., Horseshoe Bay, 0-300′, 29.V.1961, J. R. Vockeroth, both deposited in the Canadian National Collection of the Entomological Research Institute, Canadian Department of Agriculture, Ottawa, Canada. Also two ♂ paratypes from Washington, Mt. Rainier, White River, 28 Aug. 34, A. L. Melander. One of these paratypes is deposited in the collection of the U.S. National Museum, Washington, D.C. and the other in the Academy of Natural Sciences of Philadelphia.

Diagnosis. — Costal section of wing from R_1 to R_{2+3} being 1.6 to 1.8 times the distance from R_{2+3} to R_{4+5}; anterior-ventral areas of tergites 3, 4 and 5 rounded or somewhat angled, without finger-like processes; gonites long, narrow and pointed at apices, not sharply curved at apex, tapering gradually to apex but taper more abrupt in basal half, distal half thus very long and slender; aedeagus gouge-shaped, slightly curved and hooked at apex with a sclerotized bridge dividing the open posterior. Females unknown.

Description: *MALE.* — Total body length 2.92 to 3.84 mm; shining black with coppery, golden, and greyish pruinosity. *Head* shining black with coppery pruinosity except where mentioned; length 0.71 to 0.78 mm; ocellar triangle raised; 3 round ocelli; ocellar setae large, divergent; interocellar and postocellar setae small, divergent; 2 large pairs and sometimes 1 or 2 much smaller pairs of orbital setae; eyes red, oval; vertex with coppery pruinosity above, becoming golden below; 1 large pair of convergent, inner vertical setae; 1 large pair of divergent, exterior vertical setae; postorbitals and occipitals small; gena black with golden pruinosity. Face shining black with golden pruinosity, straight to concave when viewed in profile; facial depressions long, from antennal base to first parafacial seta; 1 large pair and 4 or 5 smaller pairs of parafacial setae. Clypeus with coppery pruinosity; mouthparts with greyish pruinosity. Antennae dark, brown to black with coppery pruinosity; arista brown, slightly plumose.

Thorax shining black with golden to coppery pruinosity; greyish spot at intrascutal suture; faint greyish stripes laterally along dorsocentral setal rows, between acrostichal and dorsocentral setal rows, and medially between acrostichal setal rows; scutum length 0.88 to 0.99 mm; many long acrostichal setae; many long dorsocentral setae with 2 pairs being larger than others, 1 pair at intrascutal suture and 1 pair farther posterior; 1 long pair of prescutellar setae; humeral and posthumeral setae long and fine; presuturals long and fine, 1 larger pair; 2 large pairs of notopleurals, posterior pair larger; 1 large pair of posterior intraalar setae; pleura shining black with golden pruinosity above,

becoming greyish below; 1 large pair of mesopleural setae; sternum with greyish pruinosity; katepisternal spine absent. Scutellum (Fig. 168) shining black with golden pruinosity, length 0.44 mm, apical process small and pointed, apical tubercules small, lateral tubercules absent, apical and lateral scutellar setae large. *Legs* all black or dark brown except reddish tarsi, covered with greyish pruinosity; prothoracic tibiae with long yellow setae at apex; mesothoracic tibiae each with a spur and 3 black anterior setae at apex; apex of metathoracic tibiae with 3 or 4 black anterior setae and a yellow posterior comb. *Wing* (Fig. 211) clear, slightly darkened around crossveins; no white spots; R_{2+3} sometimes with appendage near apex; veins dark brown to black; length from humeral crossvein 2.52 to 2.99 mm; width 1.12 to 1.26 mm; distance from h to R_1 0.78 to 0.88 mm; R_1 to R_{2+3} 1.19 to 1.29 mm; R_{2+3} to R_{4+5} 0.68 to 0.82 mm; R_{4+5} to M_{1+2} 0.34 to 0.44 mm; length of R_{4+5} 1.46 to 1.80 mm; length M_{1+2} 0.85 to 0.95 mm; costal section from R_1 to R_{2+3} 1.6 to 1.8 times distance from R_{2+3} to R_{4+5}; halteres light brown to yellowish.

Abdomen as in Fig. 34 except where noted; shining black with golden pruinosity anteriorly, becoming greyish posteriorly on tergites. Tergites 2 through 5 continuous dorsally or with fine lateral sutures; tergites 6, 7 and 8 absent. Sternite 1 somewhat variable with rounded anterior margin or with a broad anterior "V" notch; sternite 4 sometimes with a small anterior fragment. *Genitalia* as in Fig. 102. Note the paired gonites with long, pointed apices, with more abrupt taper at basal half, distal half thus long and slender; fused anteriorly to sternite 5. Gonal arch absent. Aedeagus gouge-shaped, curved at apex, and with a narrow sclerotized bridge dividing the open posterior; fused to aedeagal apodeme.

FEMALE. — Unknown.

Distribution. — Extreme northwestern U.S. and southwestern Canada (Fig. 226).

Specimens examined. — 4 specimens (all males, holotype and 3 paratypes) with data as listed under types.

Parydra (Chaetoapnaea) penisica n. sp.

Types. — Holotype ♂ and 1 ♂ paratype from Tyee, 27 mi. E. Pr. Rupert, B.C., Canada, 24.VI.1960, J. G. Chillcott; 2 ♂ paratypes with the same data except one collected by W. W. Moss and the other by B. S. Heming; and 3 ♂ and 7 ♀ paratypes from Kitimat, B.C., Canada, 4.VIII.1960, C. H. Mann. The holotype and all paratypes are deposited in the Canadian National Collection of the Entomological Research Institute, Canadian Department of Agriculture, Ottawa, Canada.

Diagnosis. — Costal section of wing from R_1 to R_{2+3} 2.1 to 2.6 times distance from R_{2+3} to R_{4+5}. *Male* with anterior-ventral areas of tergites 3, 4 and 5 elongated into finger-like processes; tip of tergite 9 + surstyli rounded and curving outward from midventral line; gonites long and narrow with pointed apices; and aedeagus long, broad and dagger-like. *Females* with sternite 8 consisting of a large, distinctly triangular, median sclerite and one small, comma-shaped, lateral sclerite on each side.

Description: *MALE.* — Total body length 3.40 to 3.84 mm; shining black with coppery, golden and greyish pruinosity. *Head* shining black with coppery pruinosity except where mentioned; length 0.68 to 0.75 mm; ocellar triangle raised; 3 round ocelli; ocellar setae large, divergent; interocellar and postocellar setae small, divergent; 2 large pairs and 2 or 3 small pairs of orbital setae; eyes red, oval; vertex with coppery pruinosity above, becoming greyish below; 1 large pair of convergent, inner vertical setae; 1 large pair of divergent, exterior vertical setae; postorbitals and occipitals small; gena black with golden pruinosity, greyish below eye. Face shining black with brassy pruinosity, straight to concave when viewed in profile; facial depressions long, from antennal base to first parafacial seta, with bluish-grey pruinosity; 1 large pair and 4 to 6 smaller pairs of parafacial setae. Clypeus with bluish-grey, greyish or golden pruinosity; mouthparts with greyish pruinosity. Antennae dark, brown to black with greyish to golden pruinosity; arista black, slightly plumose.

Thorax shining black with coppery to golden pruinosity; no greyish spot at intrascutal suture; faint greyish stripes between acrostichal and dorsocentral setal rows; scutum length 0.85 to 0.95 mm; many long acrostichal setae; many long dorsocentral setae with 2 pairs being larger than others, 1 pair at intrascutal suture and 1 pair farther posterior; 1 long pair of prescutellar setae; humeral and posthumeral setae long and fine; presuturals long and fine, 1 larger pair; 2 large pairs of notopleurals, posterior pair larger; 1 large pair of posterior intraalar setae; pleura shining black with golden puinosity above, becoming greyish below; 1 large pair of mesopleural setae; sternum with greyish pruinosity; katepisternal spine absent. Scutellum (Fig. 169) shining black with golden pruinosity, length 0.34 to 0.37 mm, apical process absent but scutellum is somewhat pointed, apical and lateral tubercules absent, apical and lateral scutellar setae large. *Legs* all black or very dark brown and covered with greyish pruinosity; prothoracic tibiae with long yellow setae at apex; mesothoracic tibiae each with a spur and 2 or 3 black anterior setae at apex; apex of metathoracic tibiae with 1 or 2 black anterior setae and a yellow posterior comb. *Wing* (Fig. 212) lightly clouded, slightly darkened areas around crossveins; no white spots; veins dark brown to black; length from humeral crossvein 2.55 to 3.06 mm; width 1.09 to 1.26 mm; distance from h to R_1 0.78 to 0.85 mm; R_1 to R_{2+3} 1.36 to 1.56 mm; R_{2+3} to R_{4+5} 0.58 to 0.68 mm; R_{4+5} to M_{1+2} 0.31 to 0.41 mm; length of R_{4+5} 1.63 to 1.87 mm; length of M_{1+2} 0.88 to 1.09 mm; costal section from R_1 to R_{2+3} 2.3 to 2.4 times distance from R_{2+3} to R_{4+5}; halteres brown.

Abdomen as in Fig. 35; shining black with coppery and golden pruinosity. Tergites 2 through 5 continuous dorsally or with fine lateral sutures; tergites 6, 7 and 8 absent. *Genitalia* as in Fig. 103. Note long, pointed, paired gonites with subapical processes, connected anteriorly to sternite 5. Gonal arch absent. Aedeagus long and dagger-like, fused to aedeagal apodeme. Tergite 9 + surstyli with rounded, outward-curving, lobes.

FEMALE. — Total body length 3.54 to 4.28 mm. Head, thorax, legs and wings as in males except where specified.

Head length 0.75 to 0.82 mm.

Thorax with scutum length 0.99 to 1.05 mm; scutellum length 0.37 to 0.44 mm. *Wing* length from humeral crossvein 2.99 to 3.16 mm; width 1.22 to 1.33 mm; distance from h to R_1 0.85 to 0.88 mm; R_1 to R_{2+3} 1.50 to 1.67 mm; R_{2+3} to R_{4+5} 0.65 to 0.71 mm; R_{4+5} to M_{1+2} 0.37 to 0.41 mm; length of R_{4+5} 1.77 to 1.94 mm; length of M_{1+2} 0.95 to 1.09 mm; costal section from R_1 to R_{2+3} 2.1 to 2.6 times distance from R_{2+3} to R_{4+5}.

Abdomen as in Fig. 67. Ventral receptacle as in Fig. 135.

Distribution. — Northwest Pacific coast (Fig. 230).

Specimens examined. — 15 specimens (7 ♂♂ and 8 ♀♀) including the holotype and 13 paratypes with data as listed under types. Also, 1 ♀ specimen from Eureka, California, 7.24.51, Marshall R. Wheeler.

Parydra (Chaetoapnaea) quadriloba n. sp.

Types. — Holotype ♂ and 1 ♂ and 8 ♀ paratypes from Tacoma, Washington, 27 Aug. 11. The holotype, 1 ♂ and 6 ♀ paratypes are deposited in the U.S. National Museum, Washington, D.C. and the remaining 2 ♀ paratypes are deposited in the collection of the Academy of Natural Sciences of Philadelphia, Pennsylvania. Also 3 ♂ and 2 ♀ paratypes from Everett, Washington, 4 July 1924, A. L. Melander of which 3 ♂♂ and 1 ♀ are deposited in the U.S. National Museum and the remaining ♀ is deposited in the Academy of Natural Sciences of Philadelphia.

Diagnosis. — Costal section of wing from R_1 to R_{2+3} 1.2 to 1.7 times distance from R_{2+3} to R_{4+5}. *Males* with tergite 9 + surstyli lacking dorsal projections which extend posteriorly beyond the cerci; gonites short, broad, pointed, and somewhat hooked at apex; aedeagus enlarged apically into 4 rounded lobes. *Females* with sternite 8 consisting only of a large median sclerite without a deep, narrow, posterior notch; sternite 8 slightly wider than sternite 6 or 7 but with an anterior "V" notch and rounded posterior.

Description: *MALE.* — Total body length 2.99 to 3.91 mm; shining black with coppery, golden and greyish pruinosity. *Head* shining black with coppery

pruinosity except where noted; length 0.71 to 0.78 mm; ocellar triangle raised; 3 round ocelli; ocellar setae large, divergent; interocellar and postocellar setae small, divergent; 2 large pairs of orbital setae; eyes red, oval; vertex with coppery pruinosity above, becoming golden below; 1 large pair of convergent, inner vertical setae; 1 large pair of divergent, exterior vertical setae; postorbitals and occipitals small; gena black with golden pruinosity, greyish below eyes. Face shining black with greyish pruinosity, straight to concave when viewed in profile; facial depressions long, from antennal base to first parafacial seta; 1 large pair and 3 to 5 smaller pairs of parafacial setae. Clypeus with coppery pruinosity; mouthparts with greyish pruinosity. Antennae dark, brown to black with greyish pruinosity on segments 1 and 2, coppery pruinosity on segment 3; arista black, slightly plumose.

Thorax shining black with coppery pruinosity; greyish spot at intrascutal suture; faint greyish stripes laterally along dorsocentral setal rows, between dorsocentral and acrostichal setal rows, and medially between acrostichal setal rows; scutum length 0.71 to 0.85 mm; many long acrostichal setae; many long dorsocentral setae, 1 larger pair at intrascutal suture; 1 long pair of prescutellar setae; humeral and posthumeral setae long and fine; presuturals long and fine, 1 larger pair; 2 large pairs of notopleurals, posterior pair larger; 1 large pair of posterior intraalar setae; pleura shining black with golden to coppery pruinosity above, becoming greyish below; 1 large pair of mesopleural setae; sternum with greyish pruinosity; katepisternal spine absent. Scutellum (Fig. 170) shining black with coppery pruinosity; length 0.37 to 0.44 mm; apical process small and pointed; apical and lateral tubercules absent; apical and lateral scutellar setae large. *Legs* with coxae and femurs black; trochanters, tibiae and tarsi reddish; covered with greyish pruinosity; prothoracic tibiae with long yellow setae at apex; mesothoracic tibiae each with a spur and 3 black anterior setae at apex; apex of metathoracic tibiae with an anterior cluster of black setae and a yellow posterior comb. *Wing* (Fig. 213) clouded, darkened areas around crossveins bounded by white areas, sometimes appearing purplish; one white spot posterior to medial crossvein; R_{2+3} with appendage near apex; veins brown; length from humeral crossvein 2.58 to 2.82 mm; width 1.19 to 1.29 mm; distance from h to R_1 0.78 to 0.85 mm; R_1 to R_{2+3} 1.05 to 1.29 mm; R_{2+3} to R_{4+5} 0.82 to 0.85 mm; R_{4+5} to M_{1+2} 0.37 to 0.44 mm; length of R_{4+5} 1.63 to 1.80 mm; length of M_{1+2} 0.78 to 0.92 mm; costal section from R_1 to R_{2+3} 1.3 to 1.5 times distance from R_{2+3} to R_{4+5}; halteres yellow.

Abdomen as in Fig. 36; shining black with golden pruinosity. Tergites 2 through 5 continuous dorsally or with fine lateral sutures; tergites 6, 7 and 8 absent. *Genitalia* as in Fig. 104. Note the short, slightly hooked, pointed gonites connected anteriorly to sternite 5. Gonal arch absent. Aedeagus with enlarged apex forming 4 rounded lobes, fused to aedeagal apodeme. Tergite 9 + surstyli angled and lobed at apex.

FEMALE. — Total body length 2.96 to 3.71 mm. Head, thorax, legs and wings as in males except as indicated.

Head length 0.75 to 0.82 mm.

Thorax with scutum length 0.85 to 1.02 mm; scutellum length 0.37 to 0.44 mm. *Wing* length from humeral crossvein 2.45 to 2.99 mm; width 1.19 to 1.36 mm; distance from h to R_1 0.68 to 0.85 mm; R_1 to R_{2+3} 1.02 to 1.29 mm; R_{2+3} to R_{4+5} 0.68 to 0.88 mm; R_{4+5} to M_{1+2} 0.37 to 0.48 mm; length of R_{4+5} 1.46 to 1.90 mm; length of M_{1+2} 0.65 to 0.92 mm; costal section from R_1 to R_{2+3} 1.2 to 1.7 times distance from R_{2+3} to R_{4+5}.

Abdomen as in Fig. 68. Ventral receptacle as in Fig. 136.

Distribution. — Northern U.S. and Southern Canada from coast to coast but more common in the Pacific Northwest (Fig. 225).

Specimens examined. — 124 specimens (54 ♂♂ and 70 ♀♀) including the holotype and 14 paratypes, collected from Alaska, California, Idaho, Massachusetts, Michigan, Montana, New Hampshire, Oregon, Washington, British Columbia, New Brunswick, Ontario, and Quebec. Collected from March to October except in April.

Parydra (Chaetoapnaea) socia (Cresson)

Napaea socia Cresson, 1934:213; Cresson 1949:232; Sturtevant and Wheeler 1954:225.

Types. — Cresson described this species from a holotype ♂, allotype, and 9 paratypes (7 ♂♂ and 2 ♀♀) from Berkeley Hills, Alameda Co., California, IV.11.08. All types are deposited in the collection of the Academy of Natural Sciences of Philadelphia.

Diagnosis. — Costal section of wing from R_1 to R_{2+3} 1.4 to 1.6 times distance from R_{2+3} to R_{4+5}; metathoracic tibiae each with several small spines on the anteroventral apex which extend, at most, only slightly beyond apex of tibia. *Male* with anterior-ventral areas of tergite 9 + surstyli rounded or somewhat angled; gonites long, narrow and pointed, tapering unevenly to apex, taper more abrupt in basal half, thus distal half is very long and slender; aedeagus somewhat rounded or blunt, not curved or hooked at apex. *Female* with sternite 5 subtriangular with an anterior notch; sternites 6, 7 and 8 subequal in width to other sternites; sternite 8 consisting only of a large median sclerite without a deep, narrow, posterior notch; sternite 8 blunt to convex anteriorly.

Description: *MALE.* — Total body length 2.55 to 3.37 mm; shining black with golden, coppery and greyish pruinosity. *Head* shining black with golden pruinosity except where stated; length 0.65 to 0.75 mm; ocellar triangle raised; 3 round ocelli; ocellar setae large, divergent; interocellar and postocellar setae small, divergent; 2 large pairs of orbital setae; eyes red, oval; vertex with golden pruinosity above, becoming lighter below, whitish centrally; 1

large pair of convergent, inner vertical setae; 1 large pair of divergent, exterior vertical setae; postorbitals and occipitals small; gena black with golden pruinosity. Face shining black with golden pruinosity, straight to concave when viewed in profile; facial depressions long, from antennal base to first parafacial seta; 1 large pair and 4 to 6 smaller pairs of parafacial setae. Clypeus with golden pruinosity; mouthparts with greyish pruinosity. Antennae dark, brown to black with golden and coppery pruinosity; arista black, slightly plumose.

Thorax shining black with golden pruinosity; faint greyish spot at intrascutal suture; faint greyish stripes between acrostichal and dorsocentral setal rows; scutum length 0.82 to 1.02 mm; many long acrostichal setae; many long dorsocentral setae with 1 larger pair at intrascutal suture; 1 long pair of prescutellar setae; humeral and posthumeral setae long and fine; presuturals long and fine, 1 larger pair; 2 large pairs of notopleurals, posterior pair larger; 1 large pair of posterior intraalar setae; pleura shining black with golden pruinosity above, becoming greyish below; 1 large pair of mesopleural setae; sternum with greyish pruinosity; katepisternal spine absent. Scutellum (Fig. 171) shining black with golden pruinosity; length 0.41 to 0.44 mm; apical process small and pointed; apical and lateral tubercules absent or very small; apical and lateral scutellar setae large. *Legs* with coxae, femurs, and middle of tibiae black; trochanters, base and apex of tibiae, and tarsi reddish; legs covered with greyish pruinosity; prothoracic tibiae with long yellow setae at apex; mesothoracic tibiae each with a spur and 3 black anterior setae at apex; apex of metathoracic tibiae each with several small, black, anterior setae which extend only slightly beyond apex of tibia (Fig. 182) and a yellow posterior comb. *Wing* (Fig. 214) lightly clouded, darkened areas around crossveins bounded by lighter areas; R_{2+3} with an appendage near apex; veins brown; length from humeral crossvein 2.45 to 2.65 mm; width 1.05 to 1.19 mm; distance from h to R_1 0.65 to 0.75 mm; R_1 to R_{2+3} 1.09 to 1.22 mm; R_{2+3} to R_{4+5} 0.75 to 0.82 mm; R_{4+5} to M_{1+2} 0.31 to 0.34 mm; length of R_{4+5} 1.60 to 1.63 mm; length of M_{1+2} 0.82 to 0.92 mm; costal section from R_1 to R_{2+3} 1.4 to 1.6 times distance from R_{2+3} to R_{4+5}; halteres yellow.

Abdomen as in Fig. 37 except as indicated; shining black with greyish to golden pruinosity. Tergites 2 through 5 continuous dorsally or with fine lateral sutures; tergites 6, 7 and 8 absent. Sternites 1 through 4 somewhat variable; sternite 1 small and semicircular or broadly elliptical; sternite 2 with a broad "U" notch or "V" notch anteriorly, rounded or blunt posteriorly; sternite 3 with an anterior notch, small anterior projection, or a small anterior fragment; sternite 4 with or without 2, small, anterior fragments. *Genitalia* as in Fig. 105. Note the long, narrow, pointed gonites, connected anteriorly to a rolled sternite 5. Gonal arch absent. Aedeagus large and blunt at apex, fused to aedeagal apodeme.

FEMALE. — Total body length 3.09 to 3.47 mm. Head, thorax, legs and wings as in males except as noted.

Head length 0.71 to 0.85 mm.

Thorax with scutum length 0.82 to 1.09 mm; scutellum length 0.44 to 0.51 mm. *Wing* length from humeral crossvein 2.72 to 3.06 mm; width 1.16 to 1.26 mm; distance from h to R_1 0.78 to 0.85 mm; R_1 to R_{2+3} 1.22 to 1.39 mm; R_{2+3} to R_{4+5} 0.75 to 0.88 mm; R_{4+5} to M_{1+2} 0.34 to 0.37 mm; length of R_{4+5} 1.63 to 1.87 mm; length of M_{1+2} 0.88 to 1.22 mm; costal section from R_1 to R_{2+3} 1.4 to 1.6 times distance from R_{2+3} to R_{4+5}.

Abdomen as in Fig. 69 except where mentioned. Sternites 1 through 5 somewhat variable; sternite 1 absent or very slightly sclerotized, small, widely elliptical; sternite 2 oval with anterior "V" notch or with an anterior "U" notch, wider anteriorly narrowing to a blunt posterior, sides straight; sternite 3 somewhat square or circular, sometimes with an anterior projection or notch; sternite 4 circular, sometimes with an anterior notch or 2 small anterior fragments; sternite 5 with an anterior notch, either somewhat triangular or broadly elliptical. Ventral receptacle as in Fig. 137.

Distribution. — Extreme western U.S. (Fig. 233).

Specimens examined. — 96 specimens (37 ♂♂ and 59 ♀♀) including the holotype, alloype and 9 paratypes. Collected from the following: California, Oregon, and Washington. Collected most months of the year except January, August, and September.

Parydra (Chaetoapnaea) spinosa n. sp.

Types. — Holotype ♂ from Mountain Home, S. Bernandino Co., California, IX.12.1953, E. I. Schlinger and 3 ♂ paratypes with the data Union Flat, Washington, 16.VI.16; Moscow Mt., Idaho, Sept. 16, 1917, A. L. Melander; and Lake Waha, Idaho, 9 June 1918, A. L. Melander. The holotype and the above 3 paratypes are deposited in the collection of the U.S. National Museum. Also 1 ♂ paratype from Yosemite Valley, California, V.22.08, deposited in the Academy of Natural Sciences of Philadelphia.

Diagnosis. — *Males* with tergite 9 + surstyli bearing 2, large, dorsal projections which extend posteriorly beyond cerci; gonites short, broad, pointed and somewhat hooked at apex.

Description: *MALE.* — Total body length 2.96 to 3.94 mm; shining black with coppery, golden and greyish pruinosity. *Head* shining black with coppery pruinosity except where specified; length 0.71 to 0.78 mm; ocellar triangle raised; 3 round ocelli; ocellar setae large, divergent; interocellar and postocellar setae small, divergent; 2 large pairs of orbital setae; eyes red, oval; vertex with coppery pruinosity above, becoming golden or greyish below; 1 large pair of convergent, inner vertical setae; 1 large pair of divergent, exterior vertical setae; postorbitals and occipitals small; gena black with golden pruinosity. Face shining black with coppery pruinosity, straight to concave

when viewed in profile; facial depressions long, from antennal base to first parafacial seta, covered with greyish pruinosity; 1 large pair and 4 or 5 smaller pairs of parafacial setae. Clypeus with coppery or golden pruinosity; mouthparts with greyish pruinosity. Antennae dark, brown to black with greyish pruinosity on segments 1 and 2, coppery on segment 3; arista black, slightly plumose.

Thorax shining black with coppery pruinosity; greyish spot at intrascutal suture; greyish stripes laterally along dorsocentral setal rows, and between acrostichal and dorsocentral setal rows; scutum length 0.78 to 0.85 mm; many long acrostichal setae; many long dorsocentral setae with 1 longer pair at intrascutal suture; 1 long pair of prescutellar setae; humeral and posthumeral setae long and fine; presuturals long and fine, 1 larger pair; 2 large pairs of notopleurals, posterior pair larger; 1 large pair of posterior intraalar setae; pleura shining black with coppery or golden pruinosity above, becoming greyish below; 1 large pair of mesopleural setae; sternum with greyish pruinosity; katepisternal spine absent. Scutellum (Fig. 172) shining black with coppery pruinosity, length 0.41 to 0.44 mm, apical process small and rounded, apical and lateral tubercules absent, apical and lateral scutellar setae large. *Legs* with coxae and all but apex of femurs black; trochanters, apex of femurs, tibiae, and tarsi reddish; covered with greyish pruinosity; prothoracic tibiae with long yellow setae at apex; mesothoracic tibiae each with a spur and 3 black anterior setae at apex; metathoracic tibiae with an anterior cluster of black setae and a yellow posterior comb at apex. *Wing* (Fig. 215) clouded, darkened areas at crossveins bounded by white spots, appearing purplish; one such spot posterior to medial crossvein; R_{2+3} with appendage near apex; veins brown; length from humeral crossvein 2.11 to 2.31 mm; width 0.88 to 1.12 mm; distance from h to R_1 0.65 to 0.68 mm; R_1 to R_{2+3} 0.95 to 1.05 mm; R_{2+3} to R_{4+5} 0.61 to 0.68 mm; R_{4+5} to M_{1+2} 0.34 to 0.37 mm; length of R_{4+5} 1.33 to 1.43 mm; length of M_{1+2} 0.58 to 0.68 mm; costal section from R_1 to R_{2+3} 1.5 to 1.6 times distance from R_{2+3} to R_{4+5}; halteres yellow.

Abdomen as in Fig. 38; shining black with coppery pruinosity. Tergites 2 through 5 continuous dorsally or with fine lateral sutures; tergites 6, 7 and 8 absent. *Genitalia* as in Fig. 106. Note the short, broad, pointed gonites, somewhat hooked near apex, connected anteriorly to sternite 5. Gonal arch absent. Aedeagus long and blunt with two outward projecting folds, fused to aedeagal apodeme.

FEMALE. — Unknown.

Distribution. — Far western U.S. (Fig. 234).

Specimens examined. — 5 specimens (all ♂♂) with data as listed previously for types.

Parydra (Chaetoapnaea) succurva n. sp.

Types. — Holotype ♂ and 7 paratypes (5 ♂♂ and 2 ♀♀) from

Herschell I., Y.T., Canada, July 18, 1930, O. Bryant, all deposited in the collection of the U.S. National Museum.

Diagnosis. — Costal section of wing from R_1 to R_{2+3} 1.5 to 1.7 times distance from R_{2+3} to R_{4+5}. *Male* with anterior-ventral areas of tergites 3, 4 and 5 rounded or somewhat angled; gonites long, narrow, pointed, taper more abrupt in the basal half, thus distal half is very long and slender; aedeagus curved and slightly hooked at apex, without a sclerotized bridge dividing the posterior opening. *Female* with sternites 6, 7 and 8 much wider than other sternites; sternite 8 consisting only of a large median sclerite without a deep, narrow, posterior notch, and subequal to or narrower than sternite 6 or 7.

Description: *MALE.* — Total body length 3.23 to 3.43 mm; shining black with coppery, golden and greyish pruinosity. *Head* shining black with coppery pruinosity except where mentioned; length 0.65 mm; ocellar triangle raised; 3 round ocelli; ocellar setae large, divergent; interocellar and postocellar setae small, divergent; 2 large pairs of orbital setae; eyes red, oval; vertex with coppery pruinosity above, becoming greyish to golden below; 1 large pair of convergent, inner vertical setae; 1 large pair of divergent, exterior vertical setae; postorbitals and occipitals small; gena black with golden pruinosity. Face shining black with golden pruinosity; straight to concave when viewed in profile; facial depressions long, from antennal base to first parafacial seta; 1 large pair and 4 or 5 smaller pairs of parafacial setae. Clypeus with golden pruinosity; mouthparts with greyish pruinosity. Antennae dark, brown to black with greyish to golden pruinosity; arista black, slightly plumose.

Thorax shining black with coppery pruinosity; faint greyish spot at intrascutal suture; faint greyish stripes laterally along dorsocentral setal rows and between acrostichal and dorsocentral setal rows; scutum length 0.65 to 0.71 mm; many long acrostichal setae; many long dorsocentral setae with 1 larger pair at intrascutal suture; 1 long pair of prescutellar setae; humeral and posthumeral setae long and fine; presuturals long and fine, 1 larger pair; 2 large pairs of notopleurals, posterior pair larger; 1 large pair of posterior intraalar setae; pleura shining black with coppery pruinosity above, becoming greyish below; 1 large pair of mesopleural setae; large domed area with dense yellow setae surrounding the mesothoracic spiracle; sternum with greyish pruinosity; katepisternal spine absent. Scutellum (Fig. 173) shining black with coppery pruinosity, length 0.31 mm, apical process absent, apical and lateral tubercules absent, apical and lateral scutellar setae large. *Legs* all black with golden to greyish pruinosity; prothoracic tibiae with long yellow setae at apex; mesothoracic tibiae each with a spur and 3 black anterior setae at apex; metathoracic tibiae each with 3 black anterior setae and a yellow posterior comb. *Wing* (Fig. 216) clouded, slightly darkened areas around crossveins; no white spots; veins dark brown to black; length from humeral crossvein 1.84 mm; width 0.85 to 0.88 mm; distance from h to R_1 0.51 mm; R_1 to R_{2+3} 0.85 mm; R_{2+3} to R_{4+5} 0.51 to 0.58 mm; R_{4+5} to M_{1+2} 0.27 to 0.31 mm;

length of R_{4+5} 1.02 to 1.09 mm; length of M_{1+2} 0.58 to 0.61 mm; costal section from R_1 to R_{2+3} 1.5 to 1.7 times distance from R_{2+3} to R_{4+5}; halteres very dark brown with greyish pruinosity.

Abdomen as in Fig. 39; shining black with greyish pruinosity. Tergites 2 through 5 continuous dorsally or with fine lateral sutures; tergites 6, 7 and 8 absent. *Genitalia* as in Fig. 107. Note the long, pointed, paired gonites with taper in basal half more abrupt thus the distal half is very long and narrow, connected anteriorly to sternite 5. Gonal arch absent. Aedeagus curved and slightly hooked at apex; without a bridge dividing the posterior opening; fused to aedeagal apodeme.

FEMALE. — Total body length 2.52 to 2.92 mm. Head, thorax, legs and wings as in males except as stated.

Head length 0.65 to 0.68 mm.

Thorax with scutum length 0.65 to 0.68 mm; scutellum length 0.24 to 0.27 mm. *Wing* length from humeral crossvein 1.94 to 1.97 mm; width 0.92 to 0.95 mm; distance from h to R_1 0.51 to 0.54 mm; R_1 to R_{2+3} 0.85 to 0.88 mm; R_{2+3} to R_{4+5} 0.54 mm; R_{4+5} to M_{1+2} 0.27 mm; length of R_{4+5} 1.09 mm; length of M_{1+2} 0.61 to 0.65 mm; costal section from R_1 to R_{2+3} 1.6 times distance from R_{2+3} to R_{4+5}.

Abdomen as in Fig. 70. Ventral receptacle as in Fig. 138.

Distribution. — Northwestern Canada (Fig. 230).

Specimens examined. — 8 specimens (6 ♂♂ and 2 ♀♀), including the holotype and 7 paratypes, with data as listed under types.

Parydra (Chaetoapnaea) vulgaris (Cresson)

Napaea (*Chaetoapnaea*) *vulgaris* Cresson, 1949:233-234.
Napaea vulgaris Cresson, Sturtevant and Wheeler 1954:224.

Types. — This species was described from a holotype ♂, an allotype and one paratype, all with the same data. Sturtevant and Wheeler (1954) synonomized *vulgaris* with *paullula* but an examination of the genitalia of the types and other specimens clearly convinces the senior author that they are distinct species. The senior author has examined the holotype ♂, the allotype, and the paratype ♀ and, as Cresson mentions, they bear the data, Yellowstone Lake, Yellowstone Park, Wyoming, 23 July '34, A. L. Melander. In addition, the holotype bears the type number 6629. The holotype and allotype are deposited in the collection of the Academy of Natural Sciences of Philadelphia and the paratype ♀ in the collection of the U.S. National Museum.

Diagnosis. — Costal section of wing from R_1 to R_{2+3} being 1.5 to 2.0 times the distance from R_{2+3} to R_{4+5}. *Male* with tergite 9 + surstyli round-

ed or obtusely angled midventrally; apex of gonites broad, flat and rounded; apex of aedeagus rounded with a large anterior opening, no posterior opening, when viewed posteriorly the sides are parallel from base to near apex where they converge abruptly. *Female* with sternite 8 consisting only of a large median sclerite without a deep posterior notch or often of 2 small lateral sclerites; sternite 8 much wider than sternites 6 or 7; cap of ventral receptacle about 2/3 total length of receptacle.

Description: *MALE.* — Total body length 2.92 to 3.06 mm; shining black with golden and greyish pruinosity. *Head* shining black with golden pruinosity except as noted; length 0.68 to 0.71 mm; ocellar triangle raised; 3 round ocelli; ocellar setae large, divergent; interocellar and postocellar setae small, divergent; 2 large pairs of orbital setae; eyes red, oval; vertex with golden pruinosity above, becoming lighter below and whitish centrally; 1 large pair of convergent, inner vertical setae; 1 large pair of divergent, exterior vertical setae; postorbitals and occipitals small; gena black with golden pruinosity. Face shining black with golden pruinosity, straight to concave when viewed in profile; facial depressions long, from antennal base to first parafacial seta; 1 large pair and 3 to 6 smaller pairs of parafacial setae. Clypeus with golden pruinosity; mouthparts with greyish pruinosity. Antennae dark, brown to black with golden pruinosity; arista black, slightly plumose.

Thorax shining black with golden pruinosity; greyish spot at intrascutal suture; faint greyish stripes between acrostichal and dorsocentral setal rows; scutum length 0.78 to 0.85 mm; many long acrostichal setae; many long dorsocentral setae with 1 larger pair at intrascutal suture; 1 long pair of prescutellar setae; humeral and posthumeral setae long and fine; presuturals long and fine, 1 larger pair; 2 large pairs of notopleurals, posterior pair larger; 1 large pair of posterior intraalar setae; pleura shining black with golden pruinosity above, becoming greyish below; 1 large pair of mesopleural setae; sternum with greyish pruinosity; katepisternal spine absent. Scutellum (Fig. 174) shining black with golden pruinosity, length 0.31 to 0.34 mm, apical process very small and scutellum appears pointed, apical and lateral tubercules absent, apical and lateral scutellar setae large. *Legs* mostly dark brown to black, trochanters and tarsi slightly lighter or reddish, covered with greyish pruinosity; prothoracic tibiae with long yellow setae at apex; mesothoracic tibiae each with a spur and 3 black anterior setae at apex; metathoracic tibiae with an anterior cluster of black setae and a yellow posterior comb. *Wing* (Fig. 217) clouded, darkened areas around crossveins bounded by white spots which appear purplish; one such spot posterior to medial crossvein; veins brown; length from humeral crossvein 2.45 to 2.55 mm; width 1.02 to 1.09 mm; distance from h to R_1 0.65 to 0.75 mm; R_1 to R_{2+3} 1.09 to 1.19 mm; R_{2+3} to R_{4+5} 0.68 mm; R_{4+5} to M_{1+2} 0.31 to 0.34 mm; length of R_{4+5} 1.43 to 1.53 mm; length of M_{1+2} 0.85 to 0.92 mm; costal section from R_1 to R_{2+3} 1.6 to 1.8 times distance from R_{2+3} to R_{4+5}; halteres yellow with greyish capitellum.

Abdomen as in Fig. 40; shining black with golden pruinosity. Tergites 2 through 5 continuous dorsally or with fine lateral sutures; tergites 6, 7 and 8

absent. *Genitalia* as in Fig. 108. Note the broad, flat, rounded gonites fused anteriorly to sternite 5. Gonal arch absent. Aedeagus with a rounded apex, no posterior opening, fused to aedeagal apodeme.

FEMALE. — Total body length 2.72 to 3.13 mm. Head, thorax, legs and wings as in males except as follows:

Head length 0.68 to 0.71 mm; 1 large pair and 4 or 5 smaller pairs of parafacial setae.

Thorax with scutum length 0.75 to 0.82 mm; scutellum length 0.31 to 0.34 mm. *Wing* length from humeral crossvein 2.31 to 2.38 mm; width 0.95 to 0.99 mm; distance from h to R_1 0.61 to 0.65 mm; R_1 to R_{2+3} 1.02 to 1.22 mm; R_{2+3} to R_{4+5} 0.61 to 0.68 mm; R_{4+5} to M_{1+2} 0.31 to 0.34 mm; length of R_{4+5} 1.43 to 1.53 mm; length of M_{1+2} 0.85 to 0.92 mm; costal section from R_1 to R_{2+3} 1.5 to 2.0 times distance from R_{2+3} to R_{4+5}.

Abdomen as in Fig. 71 except as noted. Tergites 1 through 5 may have a small fragment near anterior ventral angles. Sternite 8 may consist of 2 lateral fragments or a single median sclerite with a broad "U" shaped anterior notch and a blunt posterior. Ventral receptacle as in Fig. 139.

Distribution. — Scattered over the more boreal areas of North America (Fig. 234).

Specimens examined. — 26 specimens (18 ♂♂ and 8 ♀♀) including the holotype ♂, allotype, and 1 paratype ♀ from Alaska, Colorado, Wyoming, Labrador, Northwest Territory, and Quebec. Collected from May through October.

Species Not Included

Parydra (Chaetoapnaea) parva Cresson *n. dubium*

Parydra (*Chaetoapnaea*) *parva* Cresson, Wirth 1965b:750.
Napaea undulata Cresson, 1934:212-213. (preocc. Becker, 1926:102).
Parydra parva Cresson, 1949:241. (n. name for *N. undulata* Cresson).
Napaea (*Napaea*) *parva* (Cresson), Sturtevant and Wheeler 1954:224.

Type. — Cresson (1934) lists the holotype as a female from Rock Creek, District of Columbia, August 3, 1913, (R. C. Shannon). He further mentions that it is deposited at "U.S.N.M., no. 50529", and confirms that the type is at the U.S.N.M. in his 1949 paper.

The senior author has visited the U.S.N.M. and the type is not in their collection but their records indicate the type was on loan to Cresson. The senior author had visited the Academy of Natural Sciences of Philadelphia, where Cresson worked and deposited most of his types, prior to his U.S.N.M. visit but did not observe any type

bearing a *N. undulata* or *P. parva* label. Thinking that the type might have been overlooked, a letter was written to Dr. Michael G. Emsley, the acting chairman of the Department of Entomology at the Academy, and he was asked if the type could be anywhere in their collection. Both Dr. Emsley and Dr. Roback assure us that the specimen is nowhere in the Academy collection. To the best of our knowledge, the senior author is in possession of all of the material, except types, of the subfamily Parydrinae that belongs to the Academy and no specimen (with or without a type label) is included which fits the description nor has the above mentioned data.

Since the type is apparently lost and the senior author has seen no specimens which fit Cresson's description, we prefer to treat the name as a *nomen dubium*.

Parydra (Chaetoapnaea) varia Loew *n. dubium*

Parydra varia Loew, 1863:326; Loew 1864?:210.
Napaea varia (Loew), Cresson 1949:229-230.
Napaea (*Napaea*) *varia* (Loew), Sturtevant and Wheeler 1954:226.
Parydra (*Chaetoapnaea*) *varia* Loew, Wirth 1965b:750.

Type. — Loew (1863) apparently described this species from one or more male specimens from Alaska as indicated "(Sitka; Sahlberg)". Later Cresson (1949) discussed the fact that he was unable to locate the type or type series. He further noted that he thought that Loew must have had more than one specimen at the time of his description as he mentioned variation in tibial color. In a visit to the Museum of Comparative Zoology, the senior author was also unable to locate the type or any specimens from Sitka, Alaska which Loew might have observed. Also, no Loew types were seen in visits to the U.S.N.M. or Academy of Natural Sciences of Philadelphia. Consequently, we believe, as Cresson (1949) must have believed, that the type or type series must be lost.

The senior author has observed a number of specimens which were determined by many workers as *varia,* but among these are a number of new species which all would key to *varia* and fit its description. As a result, we feel that in the absence of the type the name is a *nomen dubium.*

Genus CALLINAPAEA Sturtevant and Wheeler

Subgenus CALLINAPAEA Sturtevant and Wheeler, 1954:220.

Type-species. — *Napaea* (*Callinapaea*) *aldrichi* Sturtevant and Wheeler, original designation. Wirth 1965a:62.

This genus (present designation) was first described by Sturtevant and Wheeler (1954) as a subgenus of *Napaea* and was monotypic at that time, known only by the type-species *N.* (*Callinapaea*) *aldrichi*. Later in 1965a, Wirth described another species *laurentiana* but, being aware of the fact that *Napaea* was preoccupied, placed both *aldrichi* and *laurentiana* in the genus *Parydra* as subgenus *Callinapaea*. However, on the basis of external morphology and genitalic structure, the senior author believes that this group is significantly distinct to justify considering it as a genus.

Diagnosis. — *Head* when viewed in profile, with anterior oral margin extending beyond antennal bases; facial protuberance (carina) near antennal bases, small and not extending beyond anterior oral margin; oral margin without setae; arista well-developed; orbital and ocellar setae present; parafacial setae present, first pair longer than others. *Wings* with costa reaching M_{1+2}; anterior crossvein (r-m) located directly below the junction of R_1 and the costa, and/or the anterior crossvein intercepting R_{4+5} at 1/5 or less of the distance from the junction of R_{4+5} and R_{2+3} to the costa; costal section from R_1 to R_{2+3} 4.7 to 6.0 times distance from R_{2+3} to R_{4+5}.

Description. — Small (2.38 to 2.82 mm. long), shining black flies covered with dense greyish pruinosity except on ocellar triangle, around vertical setae, and on spots and stripes on thorax. *Head* when viewed in profile with face straight, anterior oral margin extending beyond antennal bases, facial protuberance (carina) near antennal bases small and not extending beyond anterior oral margin; oral margin without setae; ocellar triangle raised; 3 round ocelli; ocellar setae large, divergent; interocellar and postocellar setae small, divergent; orbital setae large; 1 large pair of convergent, inner vertical setae; 1 large pair of divergent, exterior vertical setae. Face with dense greyish pruinosity; facial depressions long, from antennal base to first parafacial seta; 1 large pair and several smaller pairs of parafacial setae. Clypeus not visible when head is viewed in profile. Antennae with well-developed, slightly plumose arista.

Thorax with dense greyish pruinosity except for shining black spots or stripes; many rather short acrostichal and dorsocentral setae; 1 long pair of prescutellar setae; no humeral setae; 2 large pairs of notopleural setae, posterior pair larger; 1 large pair of posterior intraalar setae; 1 large pair of mesopleural setae. Scutellum shining black with one large spot of dense greyish pruinosity anteriorly and medially; apical process absent; apical and lateral

tubercules absent; apical and lateral scutellar setae large. *Legs* not raptorial; dark with greyish pruinosity; apex of prothoracic tibiae with long yellow setae; apex of mesothoracic tibiae variously setose anteriorly and with a large spur; apex of metathoracic tibiae with or without anterior setae but with a yellow posterior comb. *Wing* clear or slightly clouded with or without many dark spots; costa reaching M_{1+2}; R_{2+3} not appendiculate near apex; anterior crossvein (r-m) located directly below the junction of R_1 and costa, and/or the anterior crossvein intercepting R_{4+5} at 1/5 or less of distance from junction of R_{4+5} and R_{2+3} to costa; costal section from R_1 to R_{2+3} 4.7 to 6.0 times distance from R_{2+3} to R_{4+5}.

Abdomen shining black with greyish pruinosity. *Male* abdomen with tergites 1 through 5 present, tergite 1 consisting of a dorsal and 2 pleural sclerites, tergites 2 through 5 continuous dorsally; tergites 6, 7 and 8 absent; tergite 9 fused to surstyli; surstyli fused midventrally; sternites 2 through 7 present; gonites present, somewhat forked near apex; gonal arch present; aedeagus not fused to aedeagal apodeme. *Female* abdomen with tergites 1 through 8 present, 7 and 8 very narrow; tergite 1 as in males, tergites 2 through 8 continuous dorsally; sternites 1 through 8 present and variously shaped; genital opening posterior to sternite 8; sternite 9 absent; ventral receptacle small and mushroom-like in shape.

Key to the Nearctic Species of the Genus Callinapaea

1. Wings with numerous dark spots (Fig. 218), male abdomen and genitalia as in Figs. 41 and 109, female abdomen and ventral receptacle as in Figs. 72 and 140 ..... *aldrichi* Sturtevant and Wheeler

   Wings without numerous dark spots (Fig. 219), female abdomen and ventral receptacle as in Figs. 73 and 141, male unknown .... *laurentiana* Wirth

Callinapaea aldrichi Sturtevant and Wheeler

Napaea (*Callinapaea*) *aldrichi* Sturtevant and Wheeler, 1954:220-221.
Parydra (*Callinapaea*) *aldrichi* Sturtevant and Wheeler, Wirth 1965a:62.

Types. — Sturtevant and Wheeler (1954) apparently described this species from 7 specimens, a holotype ♀ and 6 paratypes. The senior author has examined the holotype ♀ and 3 ♂ paratypes but the location of the remaining 3 paratypes is unknown to us. The holotype ♀ is from Arcadia, California, 4.20.50, M. R. Wheeler, type number 6703, and is deposited in the collection of the Academy of Natural Sciences of Philadelphia. One ♂ paratype is from Ledges State Park, Boone Co., Iowa, VI.25, 1950, Jean Laffoon, and is deposited in the collection Iowa State University, Ames, Iowa. The other 2

♂ paratypes are in the California Academy of Sciences, San Francisco, California, and bear the following data: 1 ♂, Los Angeles, California, May 2, 1915, M. C. Van Duzee; and 1 ♂, Berkeley, California, May 28, 1915, M. C. Van Duzee. Sturtevant and Wheeler in their list of paratypes mention also Sequim, Washington though we have not seen this specimen or these specimens.

Diagnosis. — Distinguishable from the only other species, *laurentiana,* by the presence of numerous dark spots on the wings.

Description: *MALE.* — Total body length 2.38 to 2.58 mm; shining black or brown with greyish pruinosity. *Head* shining black with greyish pruinosity except as noted; length 0.44 to 0.48 mm; ocellar triangle raised and dark brown; 3 round ocelli; ocellar setae large, divergent; interocellar and postocellar setae small, divergent; 4 or 5 small pairs of orbital setae, posteriormost pair largest; eyes red, oval; vertex with dense greyish pruinosity above and below; 1 large pair of convergent, inner vertical setae; 1 large pair of divergent, exterior vertical setae; area around vertical setae dark brown; postorbitals and occipitals small; gena with dense greyish pruinosity. Face with dense greyish pruinosity, straight when viewed in profile; facial depressions long but hardly noticeable, from antennal base to first parafacial seta; 1 large pair and 2 to 4 smaller pairs of parafacial setae. Clypeus with greyish pruinosity, hidden from view when head is viewed in profile or from front; mouthparts with greyish pruinosity. Antennae dark, brown to black with greyish pruinosity; arista black, very slightly plumose.

Thorax with dense greyish pruinosity and shining black to brown spots; dark brown spots behind the humerus, around intrascutal suture, near posterior end of scutum between acrostichal and dorsocentral setal rows, and in area of intraalar setae; sometimes a dark stripe between acrostichal and dorsocentral setal rows; scutum length 0.65 mm; many, rather short, dorsocentral and acrostichal setae; 1 long pair of prescutellar setae; no humeral setae; posthumeral setae rather short and fine; presuturals rather short and fine, 1 pair larger than others; 2 large pairs of notopleurals, posterior pair much larger; 1 large pair of posterior intraalar setae; pleura shining black to brown with greyish pruinosity above and below; 1 large pair of mesopleural setae; sternum with greyish pruinosity; katepisternal spine absent. Scutellum (Fig. 175) shining black to brown with a large spot of dense greyish pruinosity anteriorly and medially; length 0.24 to 0.27 mm; apical process absent; apical and lateral tubercules absent; apical and lateral scutellar setae large. *Legs* uniform brownish to blackish with greyish pruinosity; prothoracic tibiae with long yellow setae at apex; mesothoracic femora each with a dense posterior flexor row of setae; mesothoracic tibiae each with a spur and 3 black anterior setae at apex; metathoracic tibiae with only a yellow posterior comb at apex. *Wing* (Fig. 218) clear to slightly clouded with many dark spots; cell R_1 with 4 to 6 (usually 5) dark spots; cell R_{2+3} with 3 (basal 2 elongate) dark spots;

cell R_{4+5} with 2 to 5 (usually 3 or 4) dark spots; crossveins surrounded by a dark spot; M_2 or discal cell with 1 dark spot; M_{1+2} cell and $M_3 + Cu_1$ cell each with 1 to 3 dark spots; spots on wings tend to become lighter towards the posterior wing margin; veins brown; length from humeral crossvein 1.97 to 2.14 mm; width 0.88 to 0.92 mm; distance from h to R_1 0.44 to 0.48 mm; R_1 to R_{2+3} 1.36 to 1.46 mm; R_{2+3} to R_{4+5} 0.24 to 0.31 mm; R_{4+5} to M_{1+2} 0.24 to 0.27 mm; length of R_{4+5} 1.53 to 1.67 mm; length of M_{1+2} 0.88 to 0.99 mm; costal section from R_1 to R_{2+3} 4.7 to 5.7 times distance from R_{2+3} to R_{4+5}; halteres yellow.

Abdomen as in Fig. 41; shining brown to black with greyish pruinosity. Tergites 2 through 5 continuous dorsally or with fine lateral sutures; tergites 6, 7 and 8 absent. *Genitalia* as in Fig. 109. Note tergite 9 + surstyli fused medially; somewhat forked gonites fused to gonal arch, connected anteriorly to sternite 7; and long, narrow, pointed aedeagus, not fused to aedeagal apodeme.

FEMALE. — Total body length 2.41 to 2.82 mm. Head, thorax, legs and wings as in males except where stated.

Head length 0.48 to 0.51 mm.

Thorax with scutum length 0.68 to 0.71 mm; scutellum length 0.27 to 0.31 mm. *Legs* without dense posterior flexor row of setae on mesothoracic femora. *Wing* length from humeral crossvein 2.11 to 2.28 mm; width 0.92 to 0.95 mm; distance from h to R_1 0.48 mm; R_1 to R_{2+3} 1.43 to 1.56 mm; R_{2+3} to R_{4+5} 0.24 to 0.27 mm; R_{4+5} to M_{1+2} 0.24 mm; length of R_{4+5} 1.60 to 1.77 mm; length of M_{1+2} 0.92 to 0.99 mm; costal section from R_1 to R_{2+3} 5.8 to 6.0 times distance from R_{2+3} to R_{4+5}.

Abdomen as in Fig. 72 except as mentioned. Sternites 3 and 4 somewhat variable, both elongate oval or somewhat elongate oval with a poorly sclerotized connection to 2 small, well-sclerotized, anterior fragments. Ventral receptacle as in Fig. 140.

Distribution. — Scattered, western and northern North America (Fig. 232).

Specimens examined. — 13 specimens (8 ♂♂ and 5 ♀♀), including the holotype ♀ and 3 ♂ paratypes, with the following data: Holotype ♀, Arcadia, California, 4.20.50, M. R. Wheeler; Paratype ♂, Los Angeles, California, May 2, 1915, M. C. Van Duzee; Paratype ♂, Berkeley, California, May 28, 1915, M. C. Van Duzee; Paratype ♂, Ledges State Park, Boone Co., Iowa, VI.25, 1950, Jean Laffoon; 2 ♂♂, Oak Glen, California, 2/7/45, A. L. Melander; 1 ♂, Oakdale, Washington, VI.13.'56, M. Coffey, coll. on cow excrement; 1 ♀, Mt. Constitution, Washington, 17.V.10; 1 ♀, Elkwater, Alta., Canada, 29.V.1955, J. R. Vockeroth; 1 ♂, Palmer, Alaska, June 1964, K. Sommerman, jeep trap; 1 ♀, Matanuska, Alaska,

6.5.44, J. C. Chamberlin, rotary trap; 1 ♀, Spenard, Alaska, VII.23. 57, E. L. Kessel; and 1 ♂, Waha, Idaho, 30 May '24, A. L. Melander.

Callinapaea laurentiana Wirth

Parydra (*Callinapaea*) *laurentiana* Wirth, 1965a:63.

Types. — Described by Wirth (1965) from and known by only two specimens. Wirth indicates a holotype ♂ and a paratype ♂ both from St. Louis, Quebec, 15 Aug. 1918, J. Quellet. The holotype is deposited in the Canadian National Collection, Ottawa and the paratype in the U.S. National Museum. Upon examination of the paratype, the senior author found it to be a female rather than a male as mentioned by Wirth. The senior author has not examined the holotype but Dr. J. R. Vockeroth and Mr. Shewell, upon our request, have examined the holotype and both assure us that the specimen is a female.

Diagnosis. — Distinguishable from *aldrichi* by the wings which lack numerous dark spots.

Description: *MALE.* — Unknown.

FEMALE. — Total body length 2.45 mm; shining black with coppery and greyish pruinosity. *Head* shining black with greyish pruinosity except where stated; length 0.41 mm; ocellar triangle raised and shining black with coppery pruinosity; 3 round ocelli; ocellar setae large, divergent; interocellar and postocellar setae small, divergent; 1 large pair of orbital setae; eyes red, oval; vertex with greyish pruinosity above becoming lighter greyish below; 1 large pair of convergent, inner vertical setae; 1 large pair of divergent, exterior vertical setae; area, around vertical setae and extending forward around and beyond the orbital setae, brown to black, shining, with coppery pruinosity; postorbitals and occipitals small; gena with dense grey pruinosity. Face with dense grey pruinosity, straight when viewed in profile; facial depressions long, from antennal base to first parafacial seta; 1 large pair and 4 smaller pairs of parafacial setae. Clypeus with greyish pruinosity, hidden from view when head is viewed in profile or from front; mouthparts with greyish pruinosity. Antennae dark, black to brown with coppery pruinosity; arista black, slightly plumose.

Thorax with dense greyish pruinosity, and shining black to brown stripes with coppery pruinosity between acrostichal and dorsocentral setal rows; scutum length 0.68 mm; many rather short acrostichal and dorsocentral setae; 1 long pair of prescutellar setae; no humeral setae; posthumeral setae rather short and fine; presuturals rather short and fine, 1 pair larger than others; 2 large pairs of notopleurals, posterior pair larger; 1 large pair of posterior intraalar setae; pleura shining black with grey pruinosity; 1 large pair of

mesopleural setae; sternum with grey pruinosity; katepisternal spine absent. Scutellum (Fig. 176) shining black to brown with a large spot of dense greyish pruinosity anteriorly and medially; length 0.27 mm; apical process absent; apical and lateral tubercules absent; apical and lateral scutellar setae large. *Legs* all dark brownish except tarsi slightly lighter, covered with greyish pruinosity; prothoracic tibiae with long yellow setae at apex; mesothoracic femora lacking a dense posterior flexor row of black setae; mesothoracic tibiae each with a spur and 3 black anterior setae at apex; metathoracic tibiae with anterior cluster of black setae and a yellow posterior comb at apex. *Wing* (Fig. 219) lightly clouded, darkened area around posterior crossvein bounded by white spots which appear purplish; veins brown; length from humeral crossvein 1.77 mm; width 0.78 mm; distance from h to R_1 0.41 mm; R_1 to R_{2+3} 1.19 mm; R_{2+3} to R_{4+5} 0.24 mm; R_{4+5} to M_{1+2} 0.24 mm; length of R_{4+5} 1.36 mm; length of M_{1+2} 0.68 mm; costal section from R_1 to R_{2+3} 5.0 times distance from R_{2+3} to R_{4+5}; halteres yellow.

Abdomen as in Fig. 73; shining black with golden pruinosity, light bluish to greyish spot in middle of tergite 2; tergites 1 through 8 continuous dorsally; tergites 1 through 5 broad; tergite 6 rather narrow; tergites 7 and 8 very narrow. Ventral receptacle as in Fig. 141.

Distribution. — Southeastern Canada; St. Louis, Quebec (Fig. 234).

Specimens examined. — 1 specimen (♀), the paratype with data mentioned previously under types.

Genus EUTAENIONOTUM Oldenberg

Eutaenionotum Oldenberg, 1923:315-316. Type-species *Eutaenionotum olivaceum* Oldenberg, monobasic. Becker 1926:103-104; Wirth 1965:61.

Eutaeniotum [*sic!*] Oldenberg, Sturtevant and Wheeler 1954:205; Dahl 1959: 136.

Notiphila Fallén (*partim*). Stenhammar 1844:212-213; Zetterstedt 1846: 1929-1930.

Pelina Haliday (*partim*). Becker 1896:199-200; Becker 1926:62; Séguy 1934:425.

Napaea Robineau-Desvoidy (*partim*). Cresson 1949:234-235.

Stenhammar (1844) described a species *guttipennis* within the genus *Notiphila* in section 2 (*Telmatobia*), and later Zetterstedt (1846) still placed *guttipennis* in *Notiphila*. In 1896, Becker placed *guttipennis* in *Pelina* and still did so in 1926, as did Séguy (1934). Meanwhile, Oldenberg (1923) described *Eutaenionotum* as a new genus based on the species *E. olivaceum* Oldenberg. Becker (1926)

also recognized this genus but placed only *olivaceum* in it and not *guttipennis*. However, Sturtevant and Wheeler (1954) placed *guttipennis* in the genus *Eutaenionotum* but spelled it incorrectly as *Eutaeniotum*. Apparently, Dahl (1959) followed Sturtevant and Wheeler and even used their misspelling of *Eutaenionotum*. Cresson (1949) described a species, *Napaea* (*Chaetoapnaea*) *yukonensis*, which later Wirth (1965a) found to be conspecific with *E. guttipennis*.

In this paper we have described only *E. guttipennis*, the type of which the senior author has observed. We have not seen the type of *E. olivaceum* but apparently it differs from *guttipennis* only in coloration. As Wirth (1965a) indicated, this color difference may be less than specific, and ultimately *olivaceum* and *guttipennis* will be found to be conspecific.

Diagnosis. — *Head* when viewed in profile, with anterior oral margin extending beyond antennal bases; facial protuberance (carina) near antennal bases, small and not extending beyond anterior oral margin; oral margin without setae; arista well-developed; orbital and ocellar setae present; orbital setae small, about 1/6 the length of either the inner or exterior vertical setae; parafacial setae present, first pair longer than others. *Wings* with costa reaching M_{1+2}; anterior crossvein (r-m) located directly below the junction of R_1 and the costa, and/or the anterior crossvein intercepting R_{4+5} at 1/5 or less the distance from the junction of R_{4+5} and R_{2+3} to the costa; costal section from R_1 to R_{2+3} 2.8 to 3.3 times distance from R_{2+3} to R_{4+5}.

Description. — See the following description of *E. guttipennis*!

Eutaenionotum guttipennis (Stenhammar)

Notiphila guttipennis Stenhammar, 1844:212-213; Zetterstedt 1846: 1929-1930.
Pelina guttipennis (Stenhammar), Becker 1896:199-200; Becker 1926:62; Séguy 1934:425.
Eutaeniotum [*sic!*] *guttipennis* (Stenhammar), Sturtevant and Wheeler 1954: 205-206; Dahl 1959:136.
Eutaenionotum guttipennis (Stenhammar), Wirth 1965a:61-62.
Napaea (*Chaetoapnaea*) *yukonensis* Cresson, 1949:234-235.

Type. — The senior author has observed the only specimen of this species in Stenhammar's collection at the Naturhistoriska Riksmuseum, Stockholm, Sweden and has designated this male specimen as the lectotype. The data on the specimen are as follows: "Lp in Bhn", 71-&$_3$, Riksmuseum, Stockholm.

Diagnosis. — Apparently *guttipennis* differs from the only other species, *olivaceum* which is known only from Europe, in that it is darker. *E. gutti-*

pennis has a face which is shining black, with black pruinosity and the thorax is shining black with dark coppery to black pruinosity, faint lighter and duller stripes laterally along the dorsocentral setal rows and between the dorsocentral and acrostichal setal rows.

Description: *MALE.* — Total body length 2.38 to 2.48 mm; shining black with dark coppery to black pruinosity. *Head* shining black with dark coppery to black pruinosity except as specified; length 0.44 mm; ocellar triangle raised; 3 round ocelli; ocellar setae large, divergent; interocellar and postocellar setae absent; 1 to 3 very small pairs of orbital setae; eyes red to dark brown, oval; vertex with dark coppery pruinosity; 1 large pair of convergent, inner vertical setae; 1 large pair of divergent, exterior vertical setae; postorbitals and occipitals very small; gena with black to greyish pruinosity. Face with black to greyish pruinosity, straight to slightly convex when viewed in profile; facial depressions long and large, from antennal base to first parafacial seta; 1 large pair and 3 to 5 smaller pairs of parafacial setae. Clypeus with black to greyish pruinosity, visible when head is viewed in profile or from front; mouthparts with black to greyish pruinosity. Antennae black with dark coppery pruinosity; arista black, slightly plumose.

Thorax shining black with black to greyish pruinosity; lighter, somewhat greyish stripes laterally along dorsocentral setal rows and between dorsocentral and acrostichal setal rows; scutum length 0.58 to 0.61 mm; many rather long dorsocentral and acrostichal setae; 1 long pair of prescutellar setae; humeral and posthumeral setae small and fine; presutural setae small, 1 pair larger than others; 2 large pairs of notopleurals, posterior pair slightly larger; 1 large pair of posterior intraalar setae; pleura shining black with black to greyish pruinosity; 1 large pair of mesopleural setae; sternum with black to greyish pruinosity; katepisternal spine absent. Scutellum (Fig. 177) shining black with black to dark coppery pruinosity; length 0.24 mm; apical process, apical and lateral tubercules absent; apical and lateral scutellar setae large. *Legs* uniform shining black with black to greyish pruinosity; prothoracic tibiae with long black to somewhat yellowish setae at apex; mesothoracic tibiae each with a spur and 3 black anterior setae at apex; metathoracic tibiae each with an anterior cluster of black setae and a black to yellowish posterior comb. *Wing* (Fig. 220) clouded with slightly darkened areas around crossveins, posterior crossvein (medial) often with slightly darkened area bounded by lighter areas or white spots, anterior crossvein often with a light spot near side towards wing tip; veins dark brown to black; length from humeral crossvein 1.84 to 2.21 mm; width 0.68 to 0.95 mm; distance from h to R_1 0.44 to 0.51 mm; R_1 to R_{2+3} 1.12 to 1.29 mm; R_{2+3} to R_{4+5} 0.34 to 0.41 mm; R_{4+5} to M_{1+2} 0.17 to 0.27 mm; length of R_{4+5} 1.33 to 1.60 mm; length of M_{1+2} 0.68 to 0.85 mm; costal section of wing from R_1 to R_{2+3} 2.8 to 3.3 times distance from R_{2+3} to R_{4+5}; halteres dark brown, almost black.

Abdomen as in Fig. 42; shining black with black to greyish pruinosity. Tergites 2 through 5 continuous dorsally; tergites 6, 7 and 8 absent. *Genitalia* as in Fig. 110. Note tergite 9 + surstyli with somewhat pointed apices; gonites

long and somewhat pointed, constricted near middle, fused anteriorly to sternite 6 and posteriorly to gonal arch; gonal arch complete, with small medial projection; aedeagus tubular with rounded apex and an anterior opening, not fused to aedeagal apodeme.

FEMALE. — Total body length 2.55 mm. Head, thorax, legs and wings as in males except where indicated.

Head length 0.48 mm. Face with dense greyish pruinosity.

Thorax with scutum length 0.65 mm; scutellum length 0.24 mm. *Wing* length from humeral crossvein 2.01 mm; width 0.88 mm; distance from h to R_1 0.48 mm; R_1 to R_{2+3} 1.19 mm; R_{2+3} to R_{4+5} 0.37 mm; R_{4+5} to M_{1+2} 0.24 mm; length of R_{4+5} 1.39 mm; length of M_{1+2} 0.75 mm; costal section from R_1 to R_{2+3} 3.2 times distance from R_{2+3} to R_{4+5}.

Abdomen as in Fig. 74. Ventral receptacle as in Fig. 142.

Distribution. — Europe and Alaska, probably most of northern North America (Fig. 228).

Specimens examined. — 7 specimens (6 ♂♂ and 1 ♀), including the lectotype male with data as mentioned under type, with data as follows: 2 ♂♂, Bethel, Alaska, Sept. 25, 1917, A. H. Twitchell, holotype and paratype of *Napaea yukonensis* E. T. Cresson, Jr., U.S. National Museum collection; 1 ♂, Matanuska, Alaska, 5.10.44, J. C. Chamberlin, rotary trap; 1 ♀, Aklavik, N.W.T., Canada, Sept. 8, 1931, Bryant, Lot 263; 1 ♂, Abisko, Lpl., Sweden, 15.VI.1951, J. R. Vockeroth; and 1 ♂, Europe?, Muonio, Palmen, 11, 46137.

Genus RHINONAPAEA Wirth

Rhinonapaea Wirth, 1965a:59-60. Type-species, *Parydra metallica* Cole (orig. des.).

Parydra Stenhammar (*partim*). Cole 1921:176-177; Malloch 1923:222.

Napaea Robineau-Desvoidy (*partim*). Cresson 1949:234; Sturtevant and Wheeler 1954:220.

The type-species, thus far the only species of *Rhinonapaea,* was originally described by Cole (1921) as a species of the genus *Parydra* and this placement of *metallica* was followed by Malloch (1923). Later Cresson (1949) placed *metallica* in the subgenus *Chaetoapnaea* of the genus *Napaea,* and Sturtevant and Wheeler (1954) only mention that *N. metallica* seems to better agree with their subgenus *Parydra.*

Wirth (1965a), with whom we fully agree, described the genus *Rhinonapaea* with *metallica* as the only known species. The senior author believes that on the basis of wing venation, head setae, and

genitalic structure *metallica* should be placed within a distinct genus as Wirth (1965a) has done.

Diagnosis. — *Head* when viewed in profile, with anterior oral margin extending beyond antennal bases; facial protuberance (carina) about midway from antennal bases to anterior oral margin, large, and extending to or slightly beyond anterior oral margin; oral margin without setae; arista well-developed; orbital and ocellar setae present; orbital setae large, subequal in length to either inner or exterior vertical setae; parafacial setae present, first pair longer than others. *Wings* with costa reaching M_{1+2}; anterior crossvein (r-m) located directly below junction of R_1 and costa, and/or anterior crossvein intercepting R_{4+5} at 1/5 or less of distance from the junction of R_{4+5} and R_{2+3} to costa; costal section from R_1 to R_{2+3} 3.1 to 3.9 times distance from R_{2+3} to R_{4+5}.

Description. — See *R. metallica* species description since the genus is monotypic!

Rhinonapaea metallica (Cole)

Parydra metallica Cole, 1921:176-177; Malloch 1923:222.
Napaea (*Chaetoapnaea*) *metallica* (Cole), Cresson 1949:234.
Napaea metallica (Cole), Sturtevant and Wheeler 1954:220.
Rhinonapaea metallica (Cole), Wirth 1965a:61.

Type. — This species was apparently described from a single male specimen, the holotype, from St. George Isd., Alaska, VI.28.20, G. D. Hanna deposited in the collection of the California Academy of Sciences.

Diagnosis. — Monotypic genus!

Description: *MALE.* — Total body length 2.96 to 3.50 mm; shining black with sparse golden to coppery pruinosity. *Head* shining black with sparse golden to coppery pruinosity except where mentioned; length 0.58 to 0.71 mm; ocellar triangle raised; 3 round ocelli; ocellar setae large, divergent; interocellar and postocellar setae small, divergent; 2 large pairs of orbital setae; eyes red, oval; vertex with sparse coppery pruinosity; 1 large pair of convergent, inner vertical setae; 1 large pair of divergent, exterior vertical setae; postorbitals and occipitals very small; gena with coppery pruinosity; face with sparse golden to coppery pruinosity; facial carina very large, protruding forward beyond oral margin when head is viewed in profile; facial depressions large and long, from antennal base to first parafacial seta; 1 very large pair and 2 very small pairs of parafacial setae. Clypeus with sparse golden to coppery pruinosity; mouthparts black with golden to coppery pruinosity, several pairs of small setae on prementum. Antennae very dark, black with coppery pruinosity; arista black, slightly plumose.

Thorax shining black with sparse golden to coppery pruinosity, no spots

or stripes; scutum length 0.75 to 0.85 mm; many small acrostichal and dorsocentral setae; 1 long pair of prescutellar setae; no humeral setae; posthumeral setae short and fine; presuturals short and fine, 1 pair larger than others; 2 very large pairs of notopleurals, subequal in length; 1 very large pair of posterior intraalar setae; pleura shining black with sparse golden to coppery pruinosity; 1 very large pair of mesopleural setae; 1 very large pair of sternopleural setae; sternum with sparse golden to coppery pruinosity; katepisternal spine absent. Scutellum (Fig. 178) shining black with sparse golden to coppery pruinosity; length 0.31 to 0.37 mm; apical process, apical and lateral tubercules absent; apical and lateral scutellar setae very large. *Legs* uniformly shining black with sparse golden to coppery pruinosity; prothoracic tibiae with long yellow setae at apex; mesothoracic tibiae each with a spur and 4 or 5 large, black anterior setae at apex; metathoracic tibiae with an anterior cluster of black setae and a yellow posterior comb at apex. *Wing* (Fig. 221) uniformly clouded, without darkened areas around crossveins or white spots; veins dark brown to black; length from humeral crossvein 2.28 to 2.65 mm; width 0.99 to 1.26 mm; distance from h to R_1 0.48 to 0.65 mm; R_1 to R_{2+3} 1.33 to 1.60 mm; R_{2+3} to R_{4+5} 0.37 to 0.48 mm; R_{4+5} to M_{1+2} 0.24 to 0.27 mm; length of R_{4+5} 1.63 to 2.01 mm; length of M_{1+2} 0.95 to 1.16 mm; costal section from R_1 to R_{2+3} 3.2 to 3.9 times distance from R_{2+3} to R_{4+5}; halteres very dark brown to black.

Abdomen as in Fig. 43; shining black with sparse golden to coppery pruinosity; very long. Tergites 2 through 5 continuous dorsally; tergites 6, 7 and 8 absent. *Genitalia* as in Fig. 111. Note the long blade-like tergite 9 + surstyli; narrow "U" shaped sternite 5; long, very slender, pointed gonites, each with 2 pair of setae near middle on inner surface, fused posteriorly to narrow gonal arch and connected anteriorly to sternite 6; aedeagus long, pointed, with anterior opening near apex and posterior projection at enlarged base, not fused to aedeagal apodeme.

FEMALE. — Total body length 3.30 to 3.88 mm. Head, thorax, legs and wings as in males except where stated.

Head length 0.58 to 0.68 mm.

Thorax with scutum length 0.85 to 0.88 mm; scutellum length 0.31 to 0.37 mm. *Wing* length from humeral crossvein 2.52 to 2.75 mm; width 1.16 to 1.19 mm; distance from h to R_1 0.58 to 0.68 mm; R_1 to R_{2+3} 1.53 to 1.73 mm; R_{2+3} to R_{4+5} 0.44 to 0.51 mm; R_{4+5} to M_{1+2} 0.24 to 0.27 mm; length of R_{4+5} 1.84 to 2.07 mm; length of M_{1+2} 0.99 to 1.16 mm; costal section from R_1 to R_{2+3} 3.1 to 3.6 times distance from R_{2+3} to R_{4+5}.

Abdomen as in Fig. 75. Ventral receptacle as in Fig. 143.

Distribution. — Alaska and northwestern Canada (Fig. 232).

Specimens examined. — 182 specimens (91 ♂♂ and 91 ♀♀), including the holotype, collected from Alaska and the following: Manitoba, Northwest Territory, and Yukon Territory. Collected from May through September.

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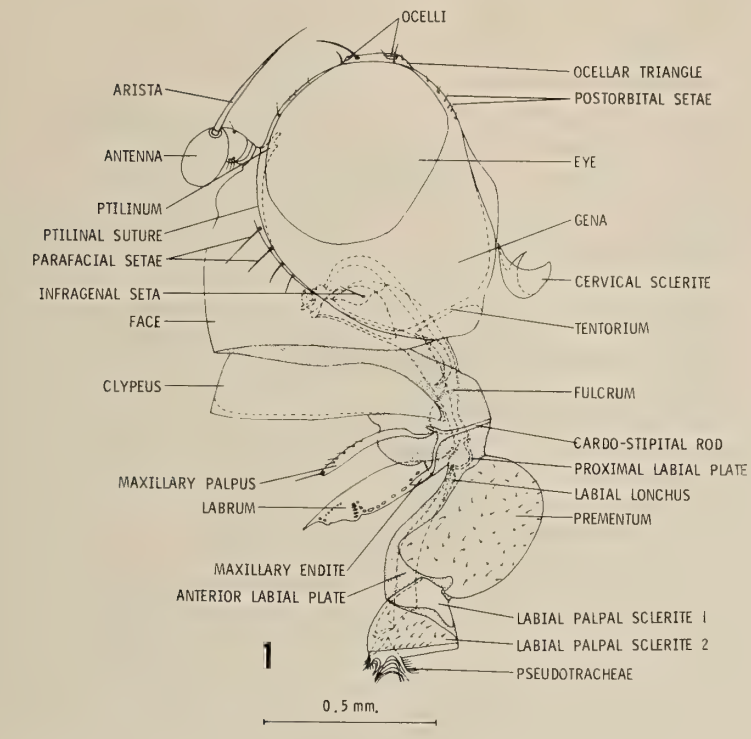
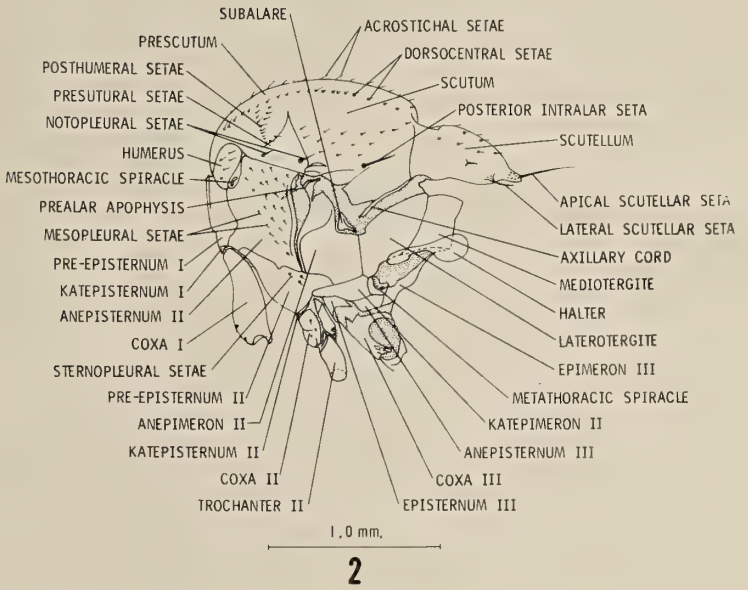
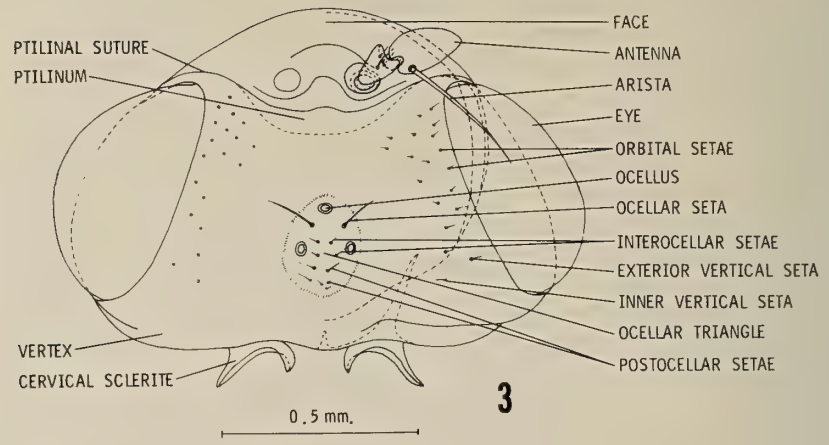
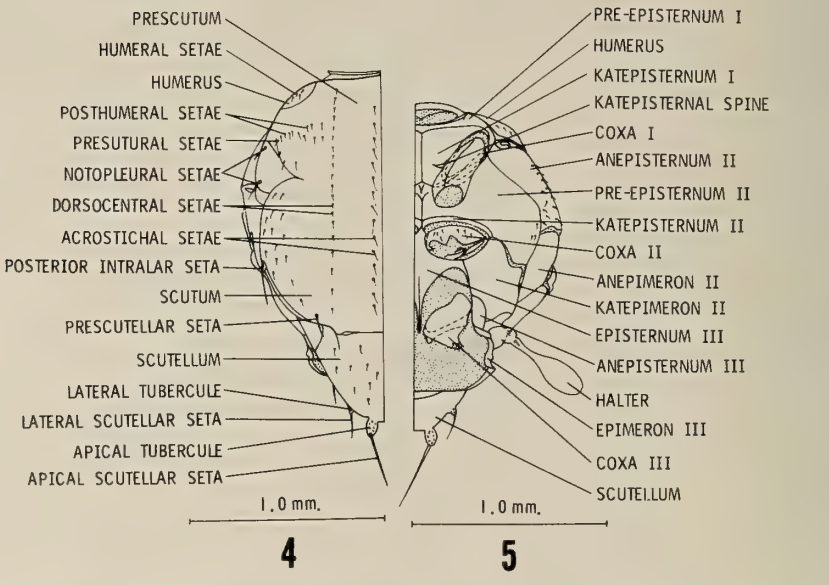


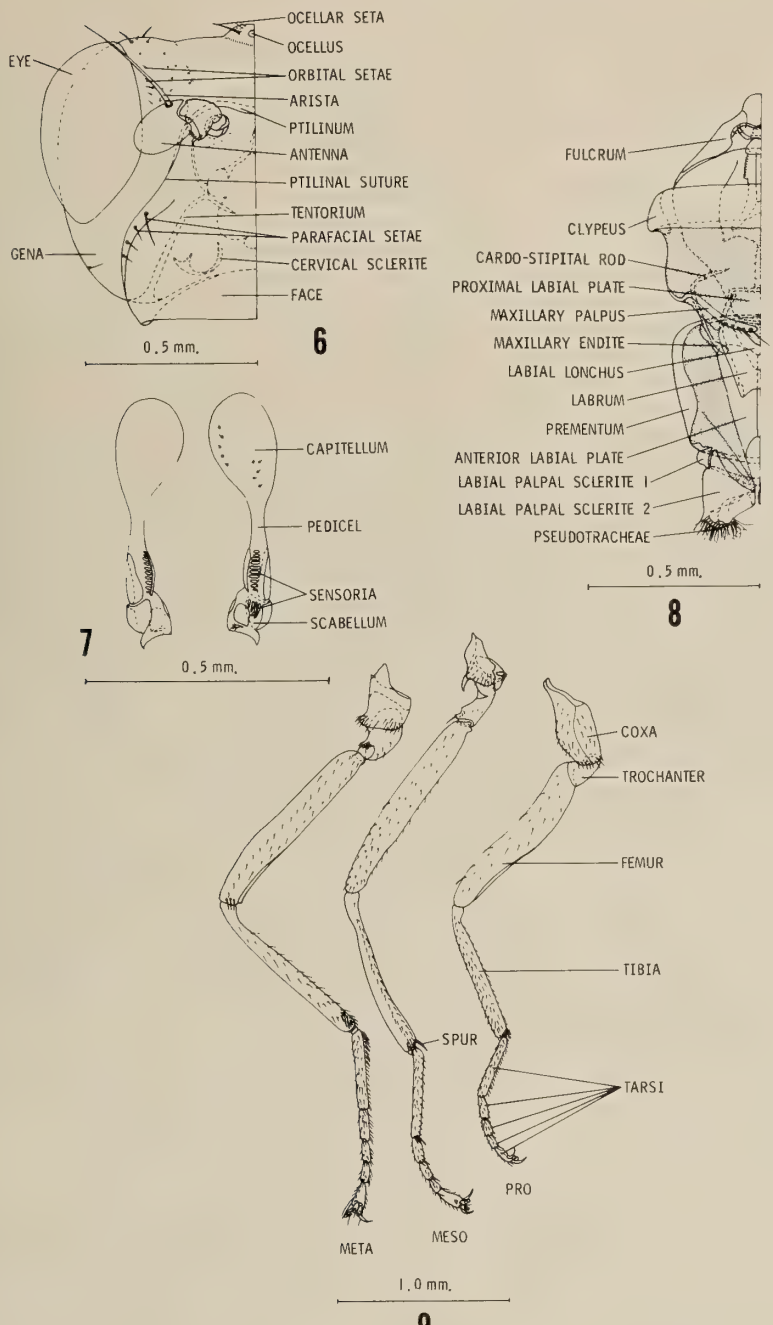


Figures 1-2 — General Morphology. — Fig. 1 — side view of the head of *Parydra quadrituberculata*; Fig. 2 — side view of the thorax of *Parydra quadrituberculata*.

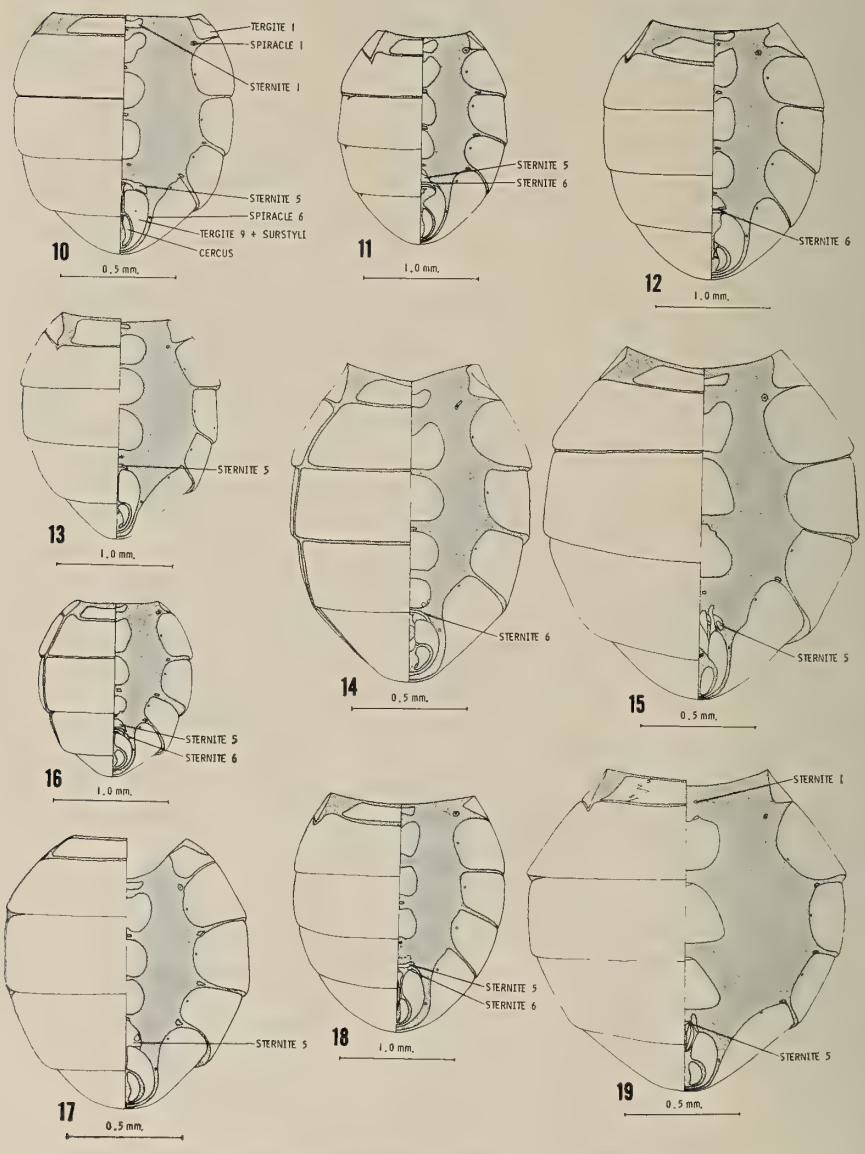




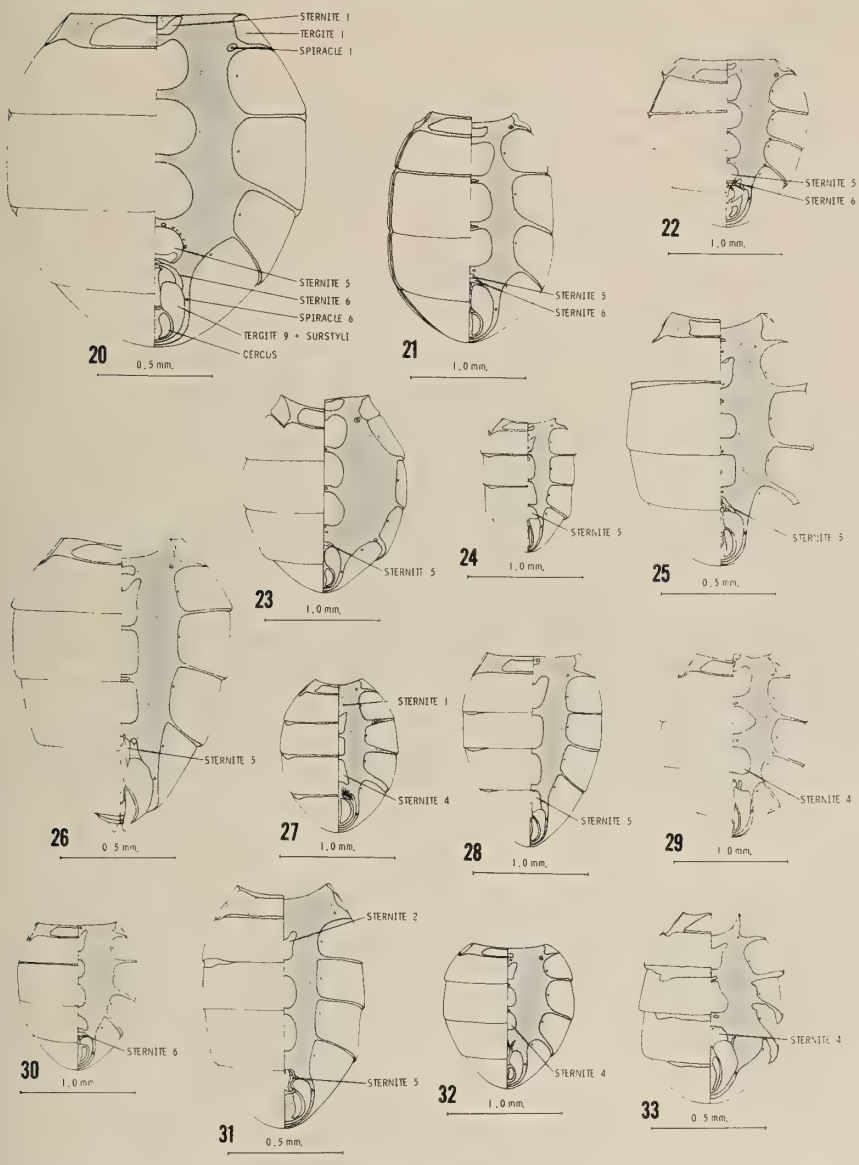
Figures 3-5 — General Morphology. — Fig. 3 — dorsal view of the head of *Parydra quadrituberculata*; Fig. 4 — dorsal view of the thorax of *Parydra quadrituberculata*; Fig. 5 — ventral view of the thorax of *Parydra quadrituberculata.*



Figures 6-9 — General Morphology. — Fig. 6 — anterior view of the head of *Parydra quadrituberculata*; Fig. 7 — view of the halter of *Parydra quadrituberculata*; Fig. 8 — anterior view of the mouthparts of *Parydra quadrituberculata*; Fig. 9 — view of the legs of *Parydra quadrituberculata*.



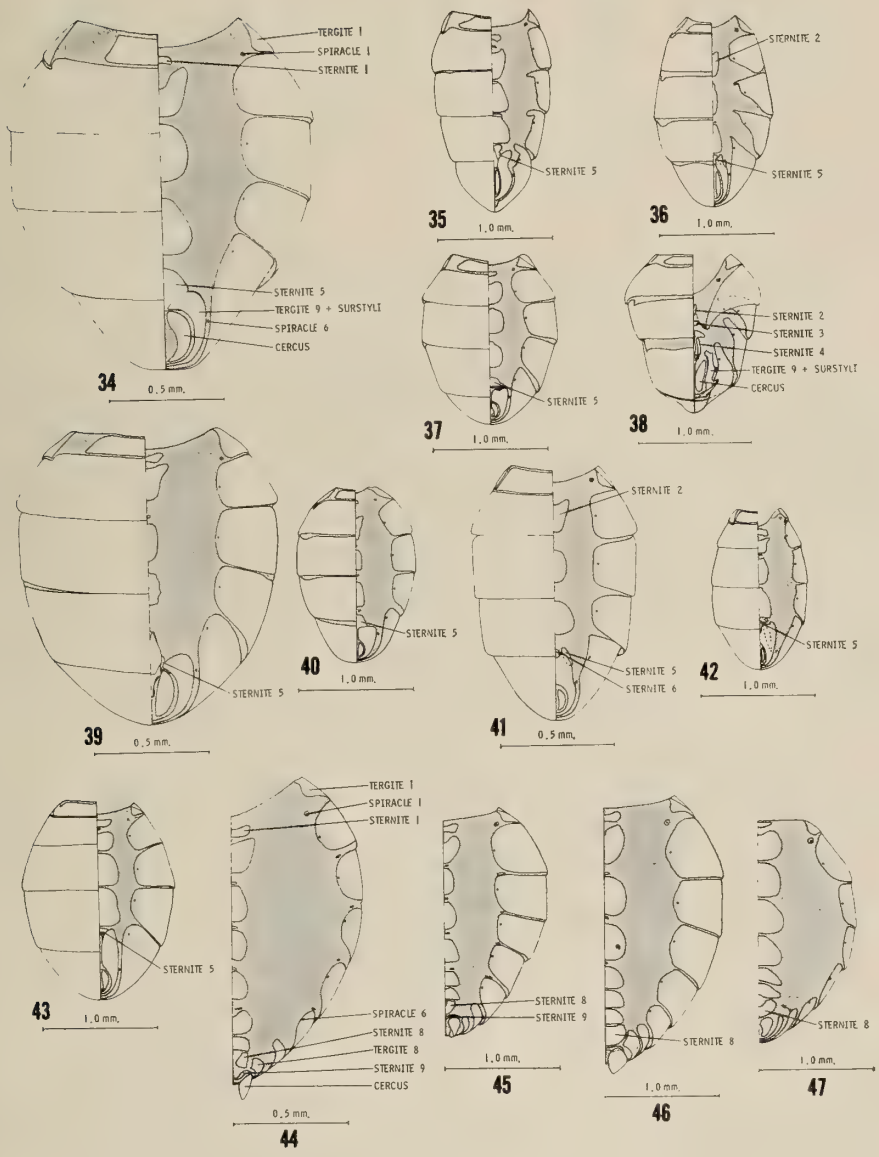
Figures 10-19 — Male abdomens. — Fig. 10 — *Parydra abbreviata*; Fig. 11 — *Parydra alpina*; Fig. 12 — *Parydra aquila tibialis*; Fig. 13 — *Parydra aurata*; Fig. 14 — *Parydra breviceps*; Fig. 15 — *Parydra humilis*; Fig. 16 — *Parydra imitans*; Fig. 17 — *Parydra penabbreviata*; Fig. 18 — *Parydra incommoda*; Fig. 19 — *Parydra lynetteae*.



Figures 20-33 — Male abdomens. — Fig. 20 — *Parydra pinguis*; Fig. 21 — *Parydra quadrituberculata*; Fig. 22 — *Parydra transversa*; Fig. 23 — *Parydra unituberculata*; Fig. 24 — *Parydra acuta*; Fig. 25 — *Parydra appendiculata*; Fig. 26 — *Parydra arctica*; Fig. 27 — *Parydra borealis*; Fig. 28 — *Parydra copis*; Fig. 29 — *Parydra hamata*; Fig. 30 — *Parydra halteralis halteralis*; Fig. 31 — *Parydra lingulata*; Fig. 32 — *Parydra parasocia*; Fig. 33 — *Parydra paullula*.

Figures 34-43 — Male abdomens. — Fig. 34 — *Parydra pedalis*; Fig. 35 — *Parydra penisica*; Fig. 36 — *Parydra quadriloba*; Fig. 37 — *Parydra socia*; Fig. 38 — *Parydra spinosa*; Fig. 39 — *Parydra succurva*; Fig. 40 — *Parydra vulgaris*; Fig. 41 — *Callinapaea aldrichi*; Fig. 42 — *Eutaenionotum guttipennis*; Fig. 43 — *Rhinonapaea metallica.*

Figures 44-47 — Female abdomens. — Fig. 44 — *Parydra abbreviata*; Fig. 45 — *Parydra alpina*; Fig. 46 — *Parydra aquila aquila*; Fig. 47 — *Parydra aurata.*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STERNITE 5
TERGITE 9 + SURSTYLI
SPIRACLE 6
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1.0 mm.
STERNITE 2
STERNITE 5
36
1.0 mm.
STERNITE 5
37
1.0 mm.
STERNITE 2
STERNITE 3
STERNITE 4
TERGITE 9 + SURSTYLI
CERCUS
38
1.0 mm.
STERNITE 5
39
0.5 mm.
STERNITE 5
40
1.0 mm.
STERNITE 2
STERNITE 5
STERNITE 6
41
0.5 mm.
STERNITE 5
42
1.0 mm.
STERNITE 5
43
1.0 mm.
TERGITE 1
SPIRACLE 1
STERNITE 1
SPIRACLE 6
STERNITE 8
TERGITE 8
STERNITE 9
CERCUS
0.5 mm.
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STERNITE 9
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STERNITE 8
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STERNITE 8
1.0 mm.
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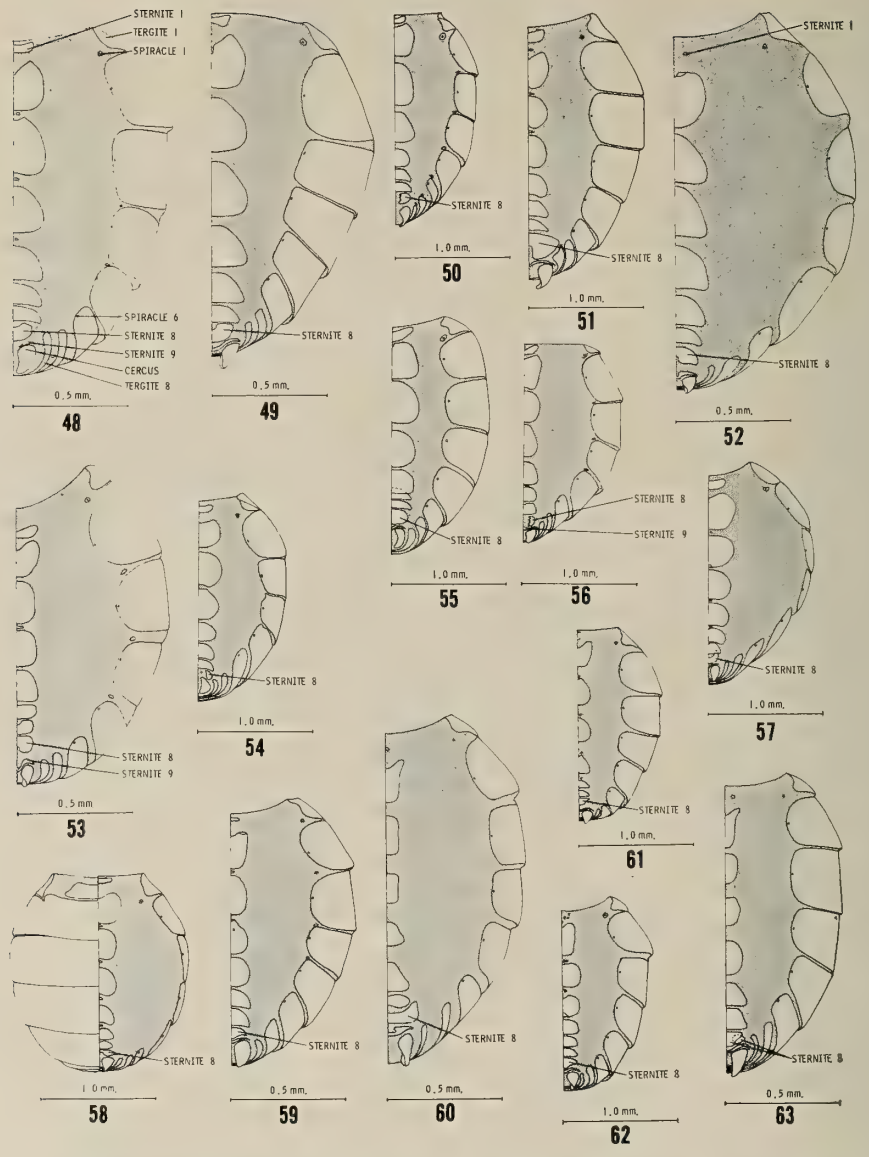
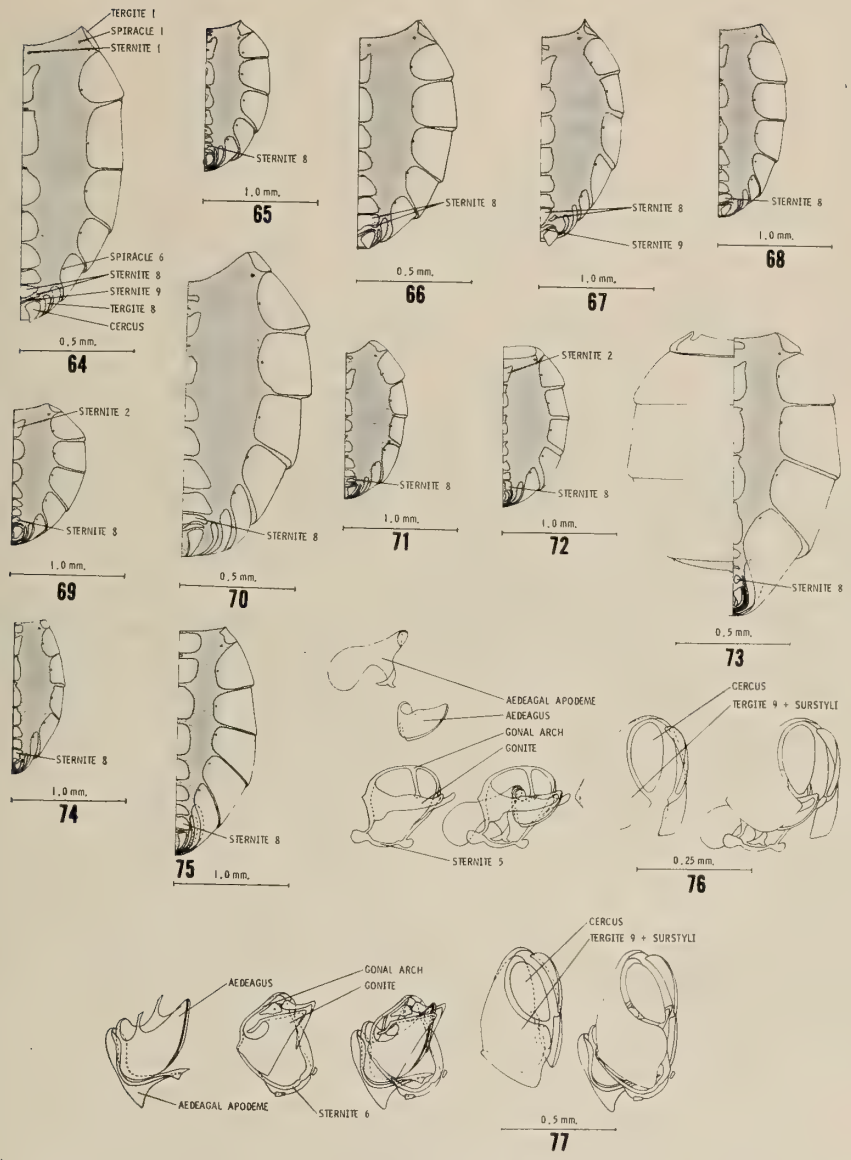
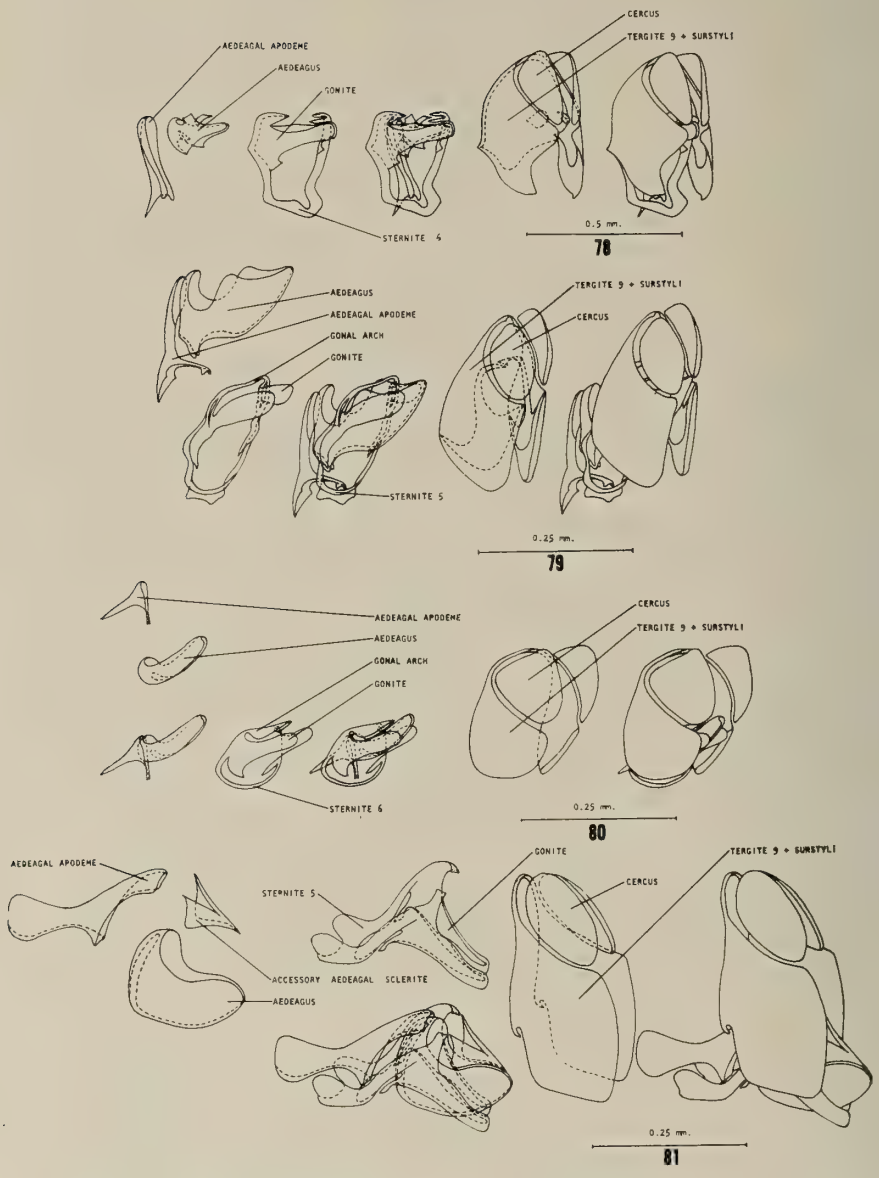


Figures 48-63 — Female abdomens. — Fig. 48 — *Parydra breviceps*; Fig. 49 — *Parydra humilis*; Fig. 50 — *Parydra imitans*; Fig. 51 — *Parydra incommoda*; Fig. 52 — *Parydra lynetteae*; Fig. 53 — *Parydra penabbreviata*; Fig. 54 — *Parydra pinguis*; Fig. 55 — *Parydra quadrituberculata*; Fig. 56 — *Parydra transversa*; Fig. 57 — *Parydra unituberculata*; Fig. 58 — *Parydra vanduzeei*; Fig. 59 — *Parydra appendiculata*; Fig. 60 — *Parydra arctica*; Fig. 61 — *Parydra borealis*; Fig. 62 — *Parydra hamata*; Fig. 63 — *Parydra halteralis joaquinensis*.

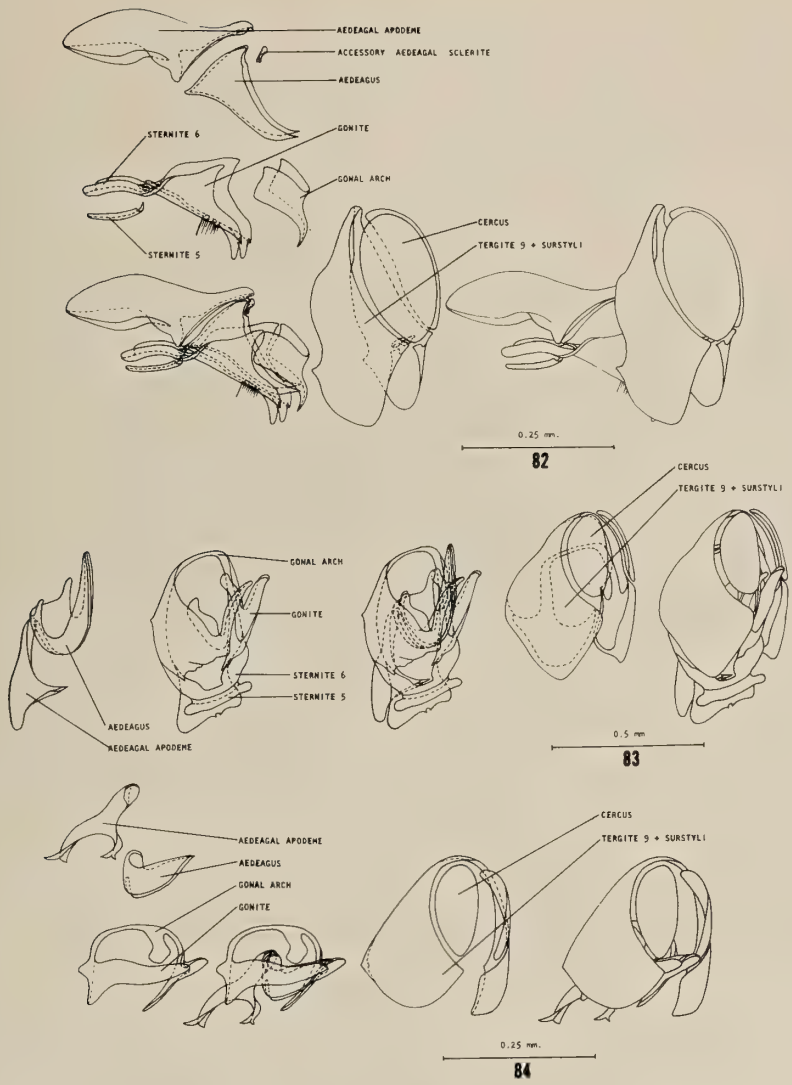


Figures 64-75 — Female abdomens. — Fig. 64 — *Parydra lingulata*; Fig. 65 — *Parydra parasocia*; Fig. 66 — *Parydra paullula*; Fig. 67 — *Parydra penisica*; Fig. 68 — *Parydra quadriloba*; Fig. 69 — *Parydra socia*; Fig. 70 — *Parydra succurva*; Fig. 71 — *Parydra vulgaris*; Fig. 72 — *Callinapaea aldrichi*; Fig. 73 — *Callinapaea laurentiana*; Fig. 74 — *Eutaenionotum guttipennis*; Fig. 75 — *Rhinonapaea metallica*.

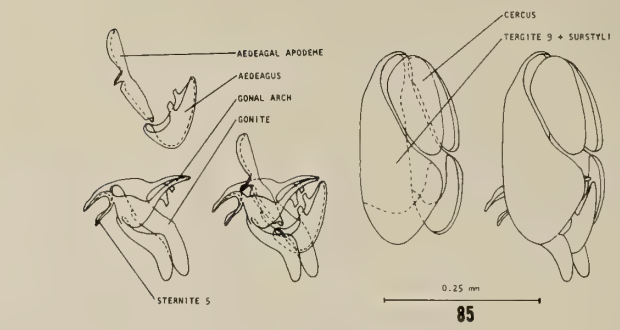
Figures 76-77 — Male genitalia. — Fig. 76 — *Parydra abbreviata*; Fig. 77 — *Parydra aquila tibialis*.

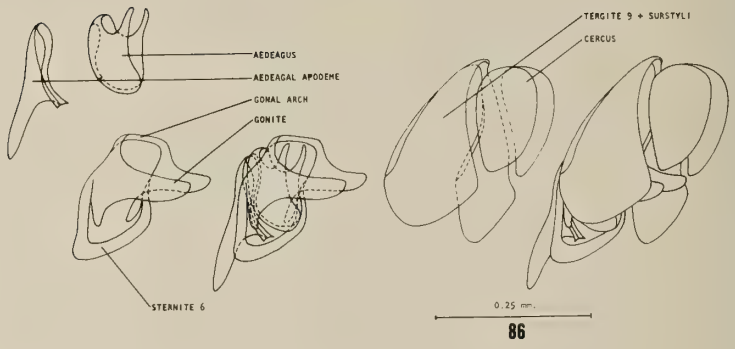


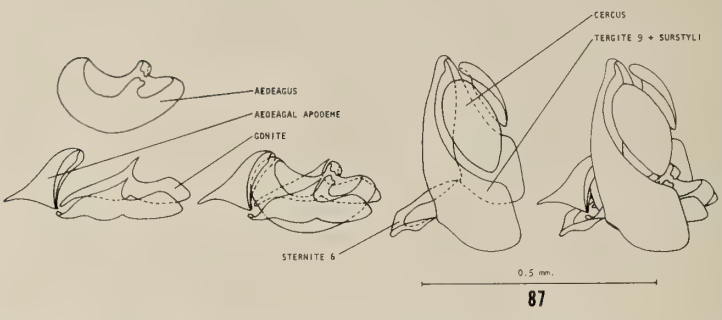
Figures 78-81 — Male genitalia. — Fig. 78 — *Parydra alpina*; Fig. 79 — *Parydra aurata*; Fig. 80 — *Parydra breviceps*; Fig. 81 — *Parydra humilis*.



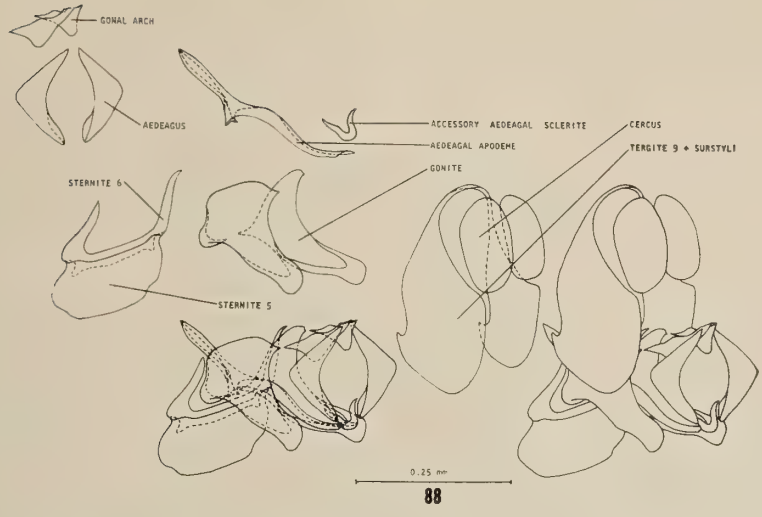
Figures 82-84 — Male genitalia. — Fig. 82 — *Parydra imitans*; Fig. 83 — *Parydra incommoda*; Fig. 84 — *Parydra penabbreviata*.

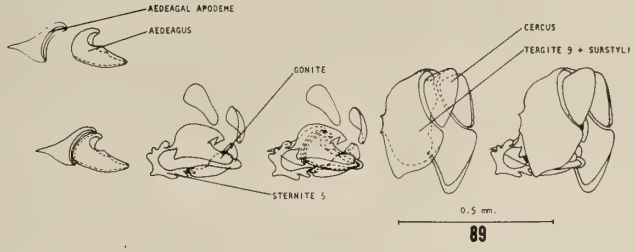


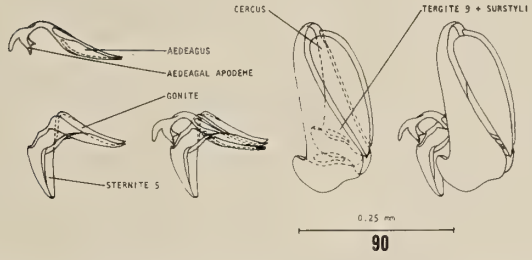




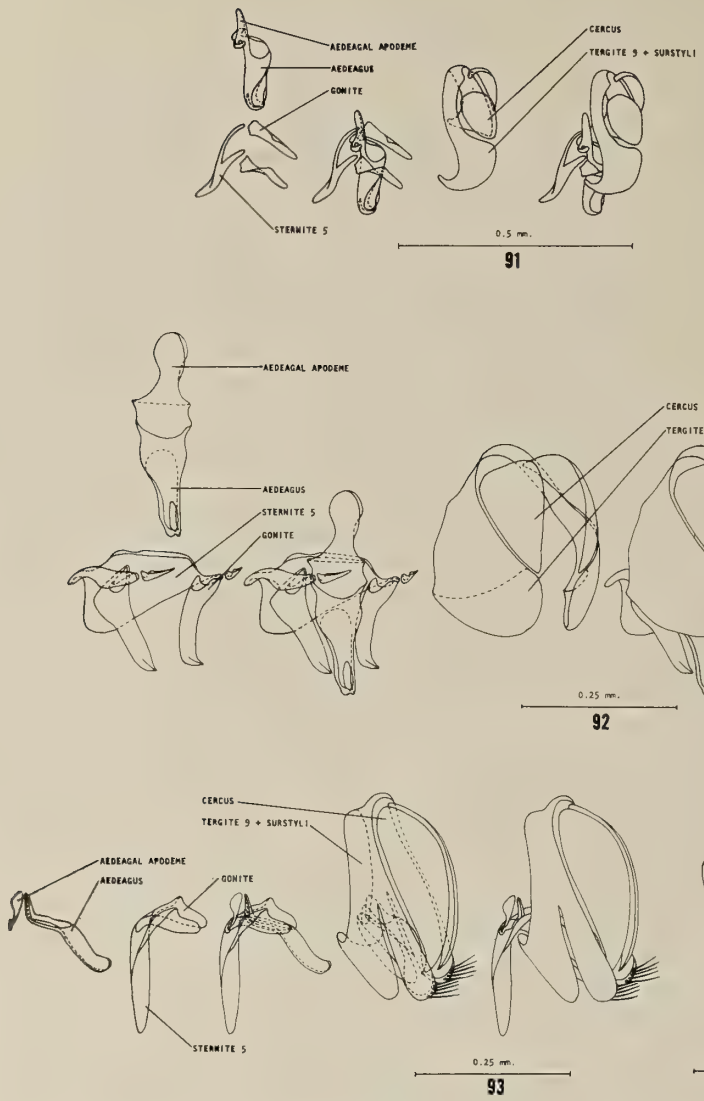
Figures 85-87 — Male genitalia. — Fig. 85 — *Parydra lynetteae*; Fig. 86 — *Parydra pinguis*; Fig. 87 — *Parydra quadrituberculata.*



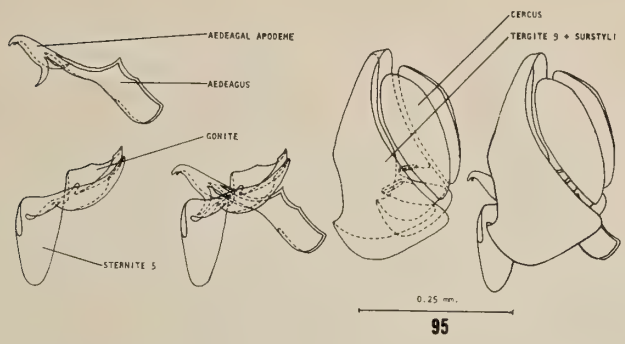


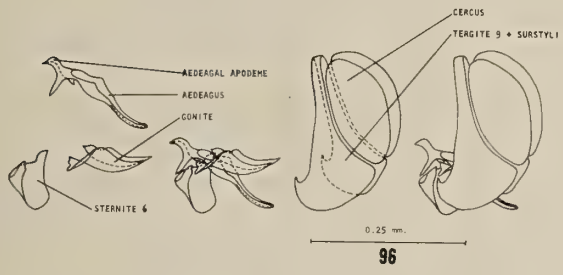


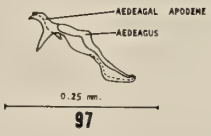
Figures 88-90 — Male genitalia. — Fig. 88 — *Parydra transversa*; Fig. 89 — *Parydra unituberculata*; Fig. 90 — *Parydra acuta*.

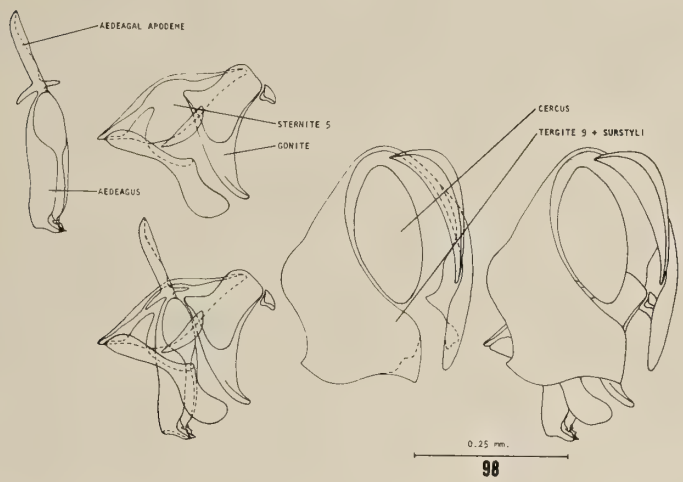


Figures 91-94 — Male genitalia. — Fig. 91 — *Parydra appendiculata*; Fig. 92 — *Parydra arctica*; Fig. 93 — *Parydra borealis*; Fig. 94 — *Parydra borealis* with tergite 9 + surstyli undivided.

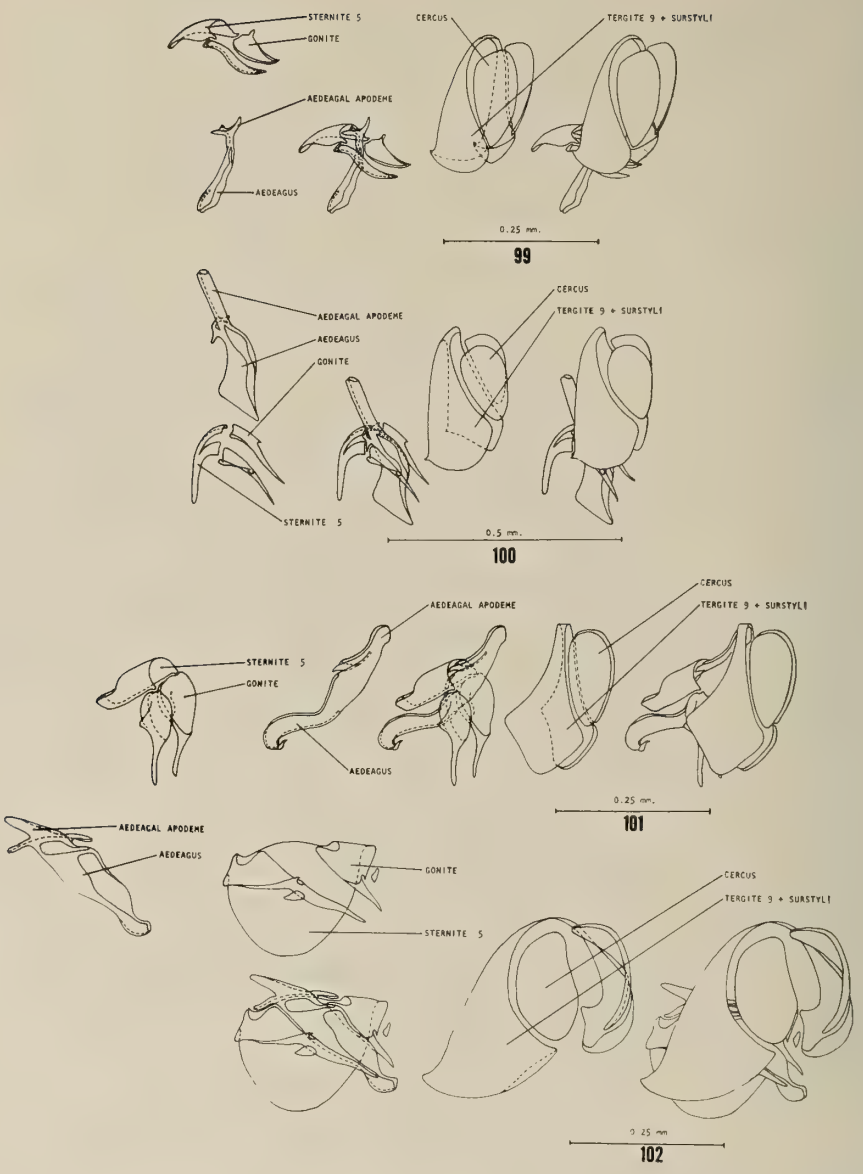




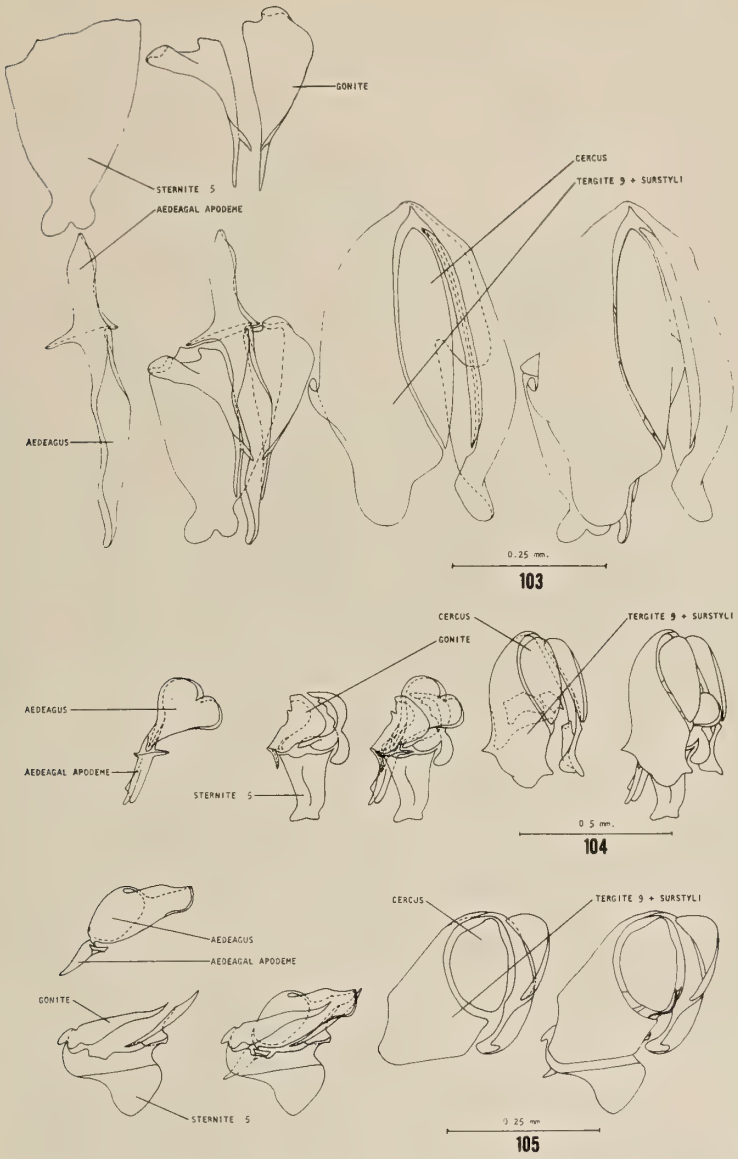




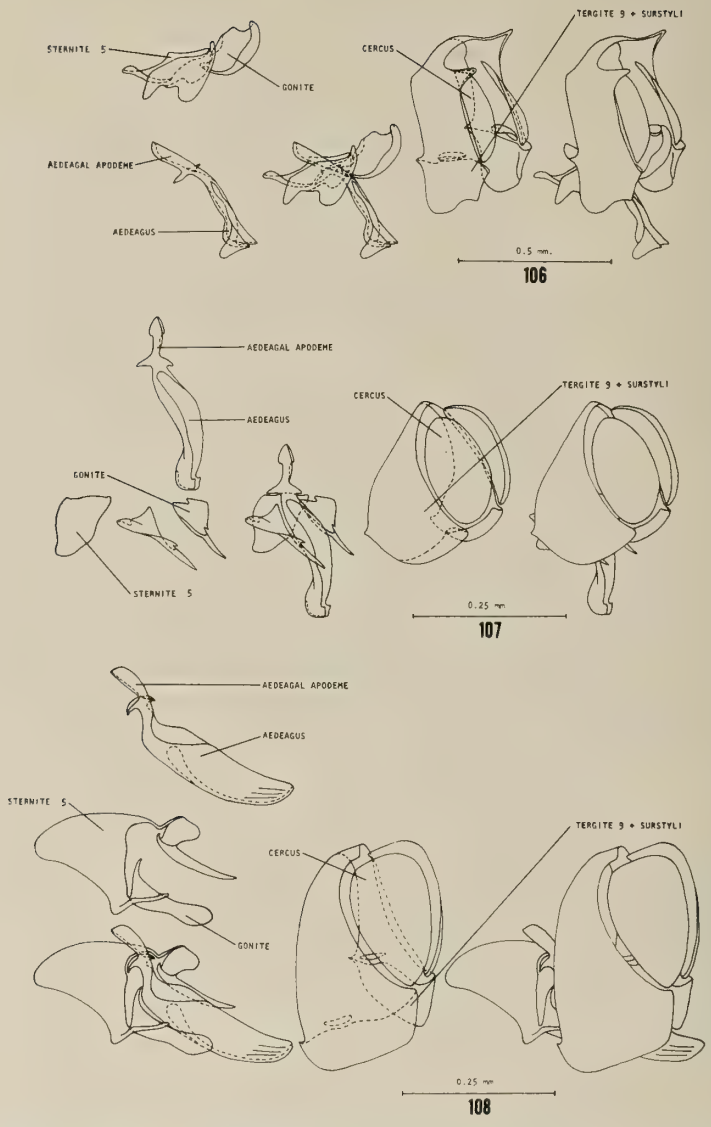
Figures 95-98 — Male genitalia. — Fig. 95 — *Parydra copis*; Fig. 96 — *Parydra halteralis joaquinensis*; Fig. 97 — aedeagus and aedeagal apodeme of *Parydra halteralis halteralis*; Fig. 98 — *Parydra hamata.*



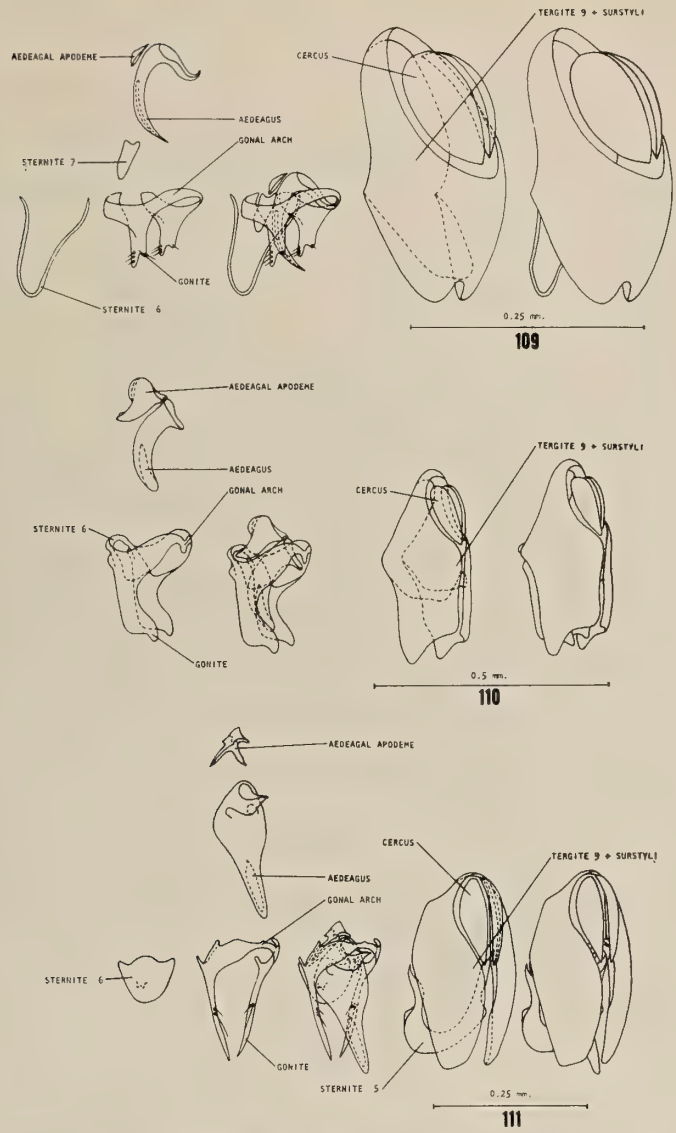
Figures 99-102 — Male genitalia. — Fig. 99 — *Parydra lingulata*; Fig. 100 — *Parydra parasocia*; Fig. 101 — *Parydra paullula*; Fig. 102 — *Parydra pedalis*.



Figures 103-105 — Male genitalia. — Fig. 103 — *Parydra penisica*; Fig. 104 — *Parydra quadriloba*; Fig. 105 — *Parydra socia.*



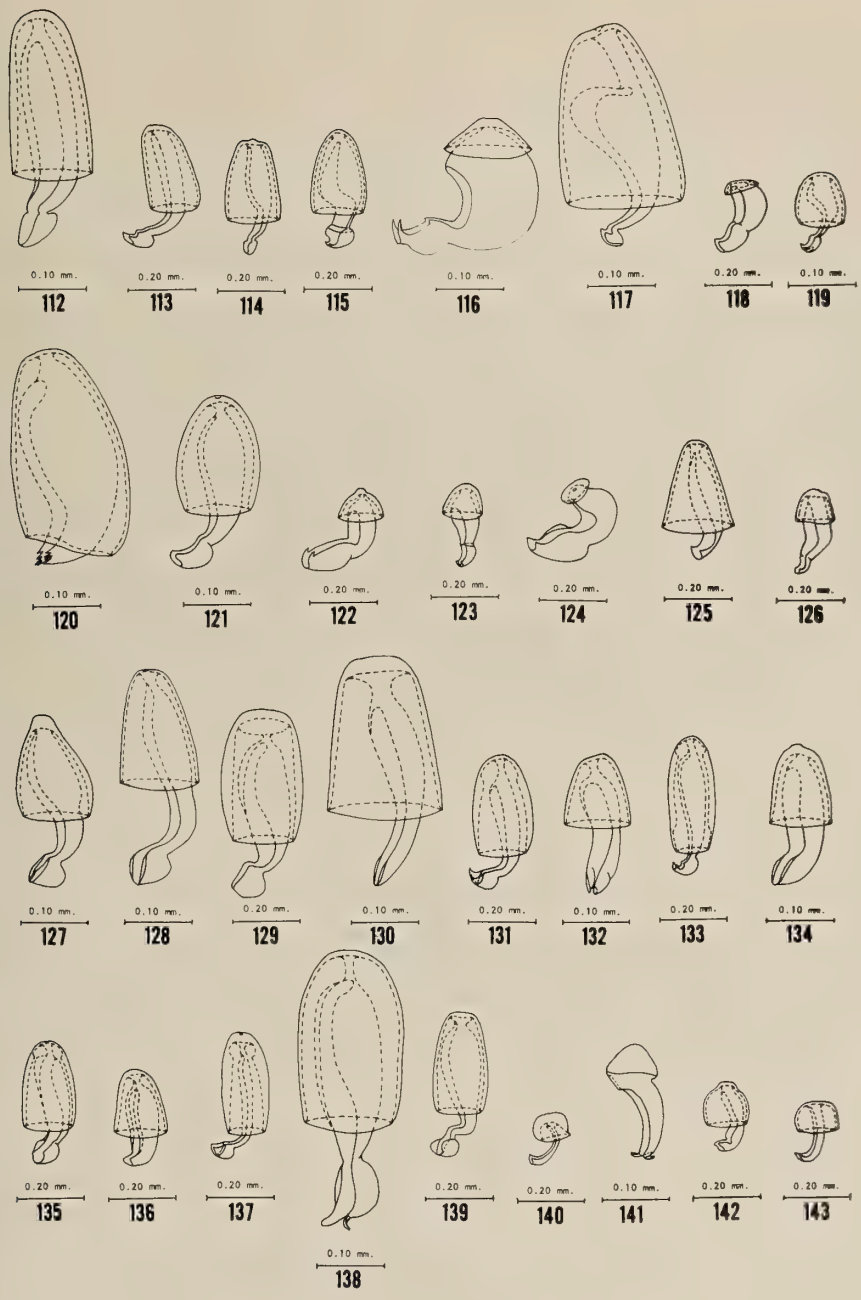
Figures 106-108 — Male genitalia. — Fig. 106 — *Parydra spinosa*; Fig. 107 — *Parydra succurva*; Fig. 108 — *Parydra vulgaris*.



Figures 109-111 — Male genitalia. — Fig. 109 — *Callinapaea aldrichi*; Fig. 110 — *Eutaenionotum guttipennis*; Fig. 111 — *Rhinonapaea metallica*.

Figures 112-143 — Ventral receptacles.

Fig. 112 — *Parydra abbreviata*
Fig. 113 — *Parydra alpina*
Fig. 114 — *Parydra aquila aquila*
Fig. 115 — *Parydra aurata*
Fig. 116 — *Parydra breviceps*
Fig. 117 — *Parydra humilis*
Fig. 118 — *Parydra imitans*
Fig. 119 — *Parydra incommoda*
Fig. 120 — *Parydra lynetteae*
Fig. 121 — *Parydra penabbreviata*
Fig. 122 — *Parydra pinguis*
Fig. 123 — *Parydra quadrituberculata*
Fig. 124 — *Parydra transversa*
Fig. 125 — *Parydra unituberculata*
Fig. 126 — *Parydra vanduzeei*
Fig. 127 — *Parydra appendiculata*
Fig. 128 — *Parydra arctica*
Fig. 129 — *Parydra borealis*
Fig. 130 — *Parydra halteralis joaquinensis*
Fig. 131 — *Parydra hamata*
Fig. 132 — *Parydra lingulata*
Fig. 133 — *Parydra parasocia*
Fig. 134 — *Parydra paullula*
Fig. 135 — *Parydra penisica*
Fig. 136 — *Parydra quadriloba*
Fig. 137 — *Parydra socia*
Fig. 138 — *Parydra succurva*
Fig. 139 — *Parydra vulgaris*
Fig. 140 — *Callinapaea aldrichi*
Fig. 141 — *Callinapaea laurentiana*
Fig. 142 — *Eutaenionotum guttipennis*
Fig. 143 — *Rhinonapaea metallica*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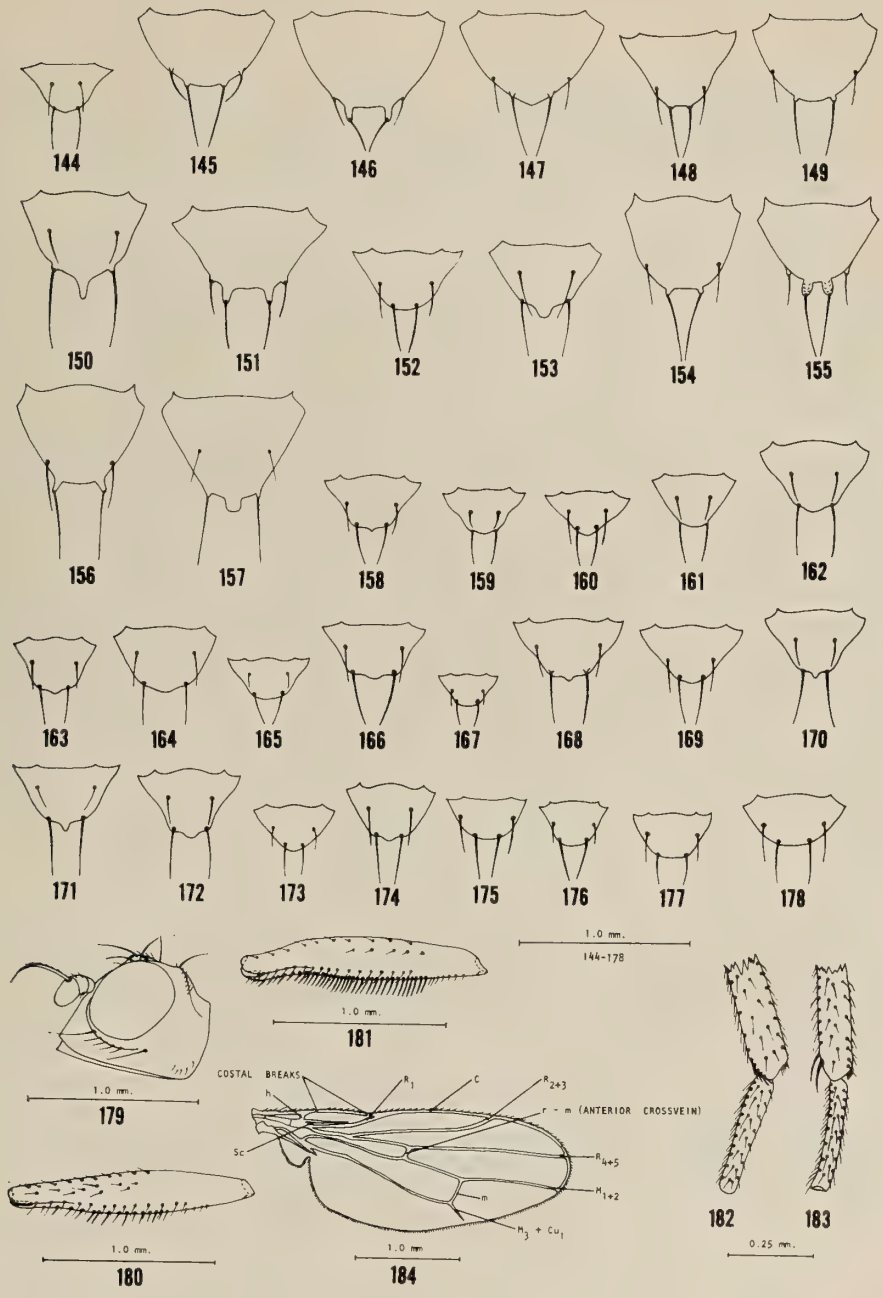
Figures 144-178 — Scutelli.

Fig. 144 — *Parydra abbreviata*
Fig. 145 — *Parydra alpina*
Fig. 146 — *Parydra aquila aquila*
Fig. 147 — *Parydra aurata*
Fig. 148 — *Parydra breviceps*
Fig. 149 — *Parydra humilis*
Fig. 150 — *Parydra imitans*
Fig. 151 — *Parydra incommoda*
Fig. 152 — *Parydra lynetteae*
Fig. 153 — *Parydra penabbreviata*
Fig. 154 — *Parydra pinguis*
Fig. 155 — *Parydra quadrituberculata*
Fig. 156 — *Parydra transversa*
Fig. 157 — *Parydra unituberculata*
Fig. 158 — *Parydra acuta*
Fig. 159 — *Parydra appendiculata*
Fig. 160 — *Parydra arctica*
Fig. 161 — *Parydra borealis*
Fig. 162 — *Parydra copis*
Fig. 163 — *Parydra halteralis joaquinensis*
Fig. 164 — *Parydra hamata*
Fig. 165 — *Parydra lingulata*
Fig. 166 — *Parydra parasocia*
Fig. 167 — *Parydra paullula*
Fig. 168 — *Parydra pedalis*
Fig. 169 — *Parydra penisica*
Fig. 170 — *Parydra quadriloba*
Fig. 171 — *Parydra socia*
Fig. 172 — *Parydra spinosa*
Fig. 173 — *Parydra succurva*
Fig. 174 — *Parydra vulgaris*
Fig. 175 — *Callinapaea aldrichi*
Fig. 176 — *Callinapaea laurentiana*
Fig. 177 — *Eutaenionotum guttipennis*
Fig. 178 — *Rhinonapaea metallica*

Figures 179-184 — Miscellaneous illustrations.

Fig. 179 — head of *Parydra copis*
Fig. 180 — femur of *Parydra aquila tibialis*
Fig. 181 — femur of *Parydra incommoda*
Fig. 182 — metatibial base and first tarsal segment of leg of *Parydra socia*
Fig. 183 — metatibial base and first tarsal segment of leg of *Parydra parasocia*
Fig. 184 — wing showing typical wing venation of a fly of the genus *Parydra*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M_{1+2}
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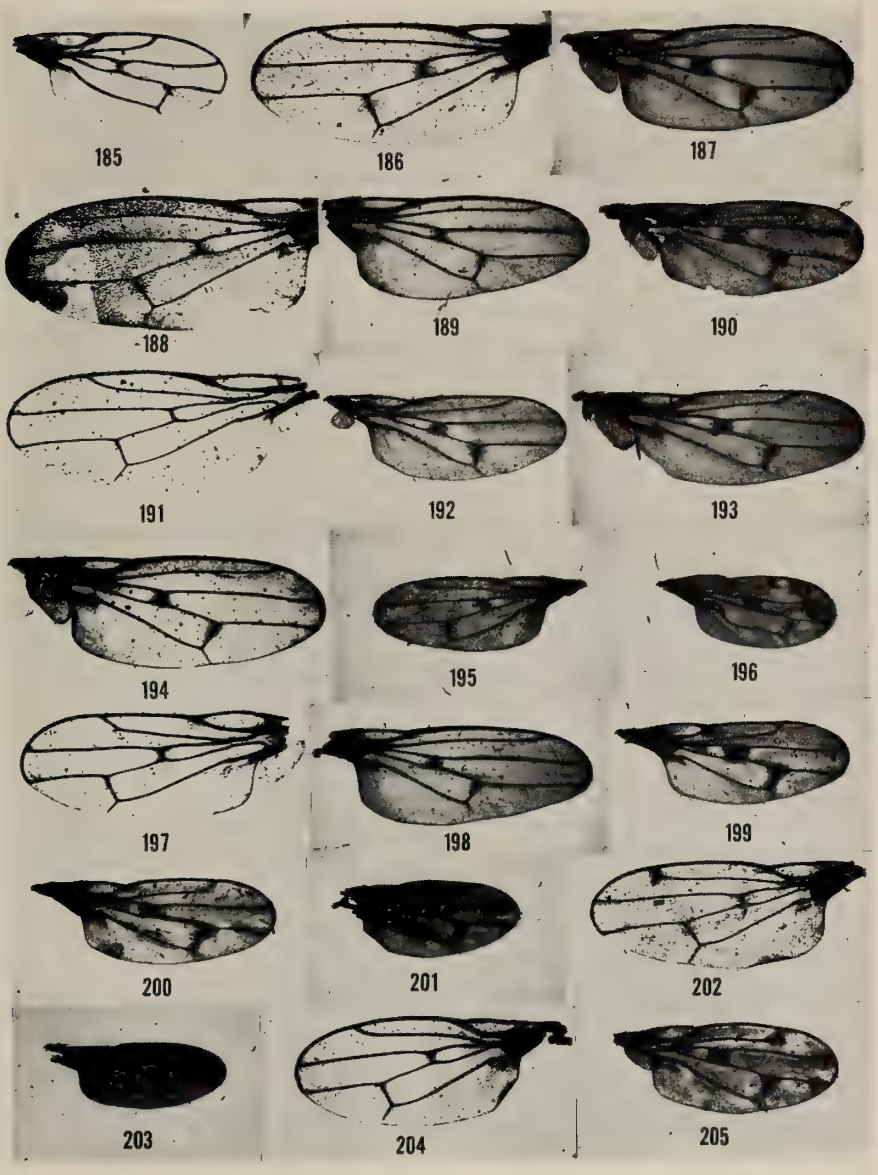
Figures 185-205 — Wings. — Fig. 185 — *Parydra abbreviata*; Fig. 186 — *Parydra alpina*; Fig. 187 — *Parydra aquila aquila*; Fig. 188 — *Parydra aquila papulata*; Fig. 189 — *Parydra aquila tibialis*; Fig. 190 — *Parydra aurata*; Fig. 191 — *Parydra breviceps*; Fig. 192 — *Parydra humilis*; Fig. 193 — *Parydra imitans*; Fig. 194 — *Parydra incommoda*; Fig. 195 — *Parydra lynetteae*; Fig. 196 — *Parydra penabbreviata*; Fig. 197 — *Parydra pinguis*; Fig. 198 — *Parydra quadrituberculata*; Fig. 199 — *Parydra transversa*; Fig. 200 — *Parydra unituberculata*; Fig. 201 — *Parydra acuta*; Fig. 202 — *Parydra appendiculata*; Fig. 203 — *Parydra arctica*; Fig. 204 — *Parydra borealis*; Fig. 205 — *Parydra copis*.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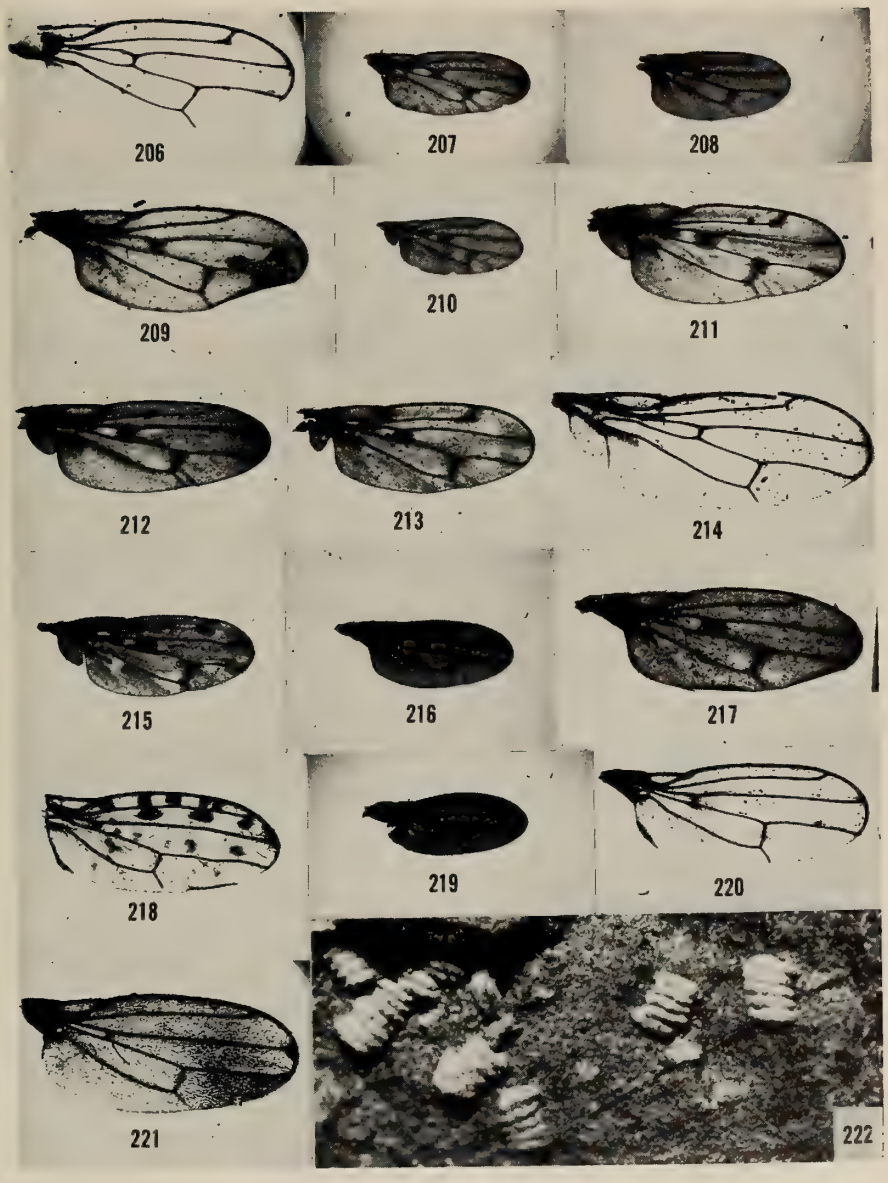
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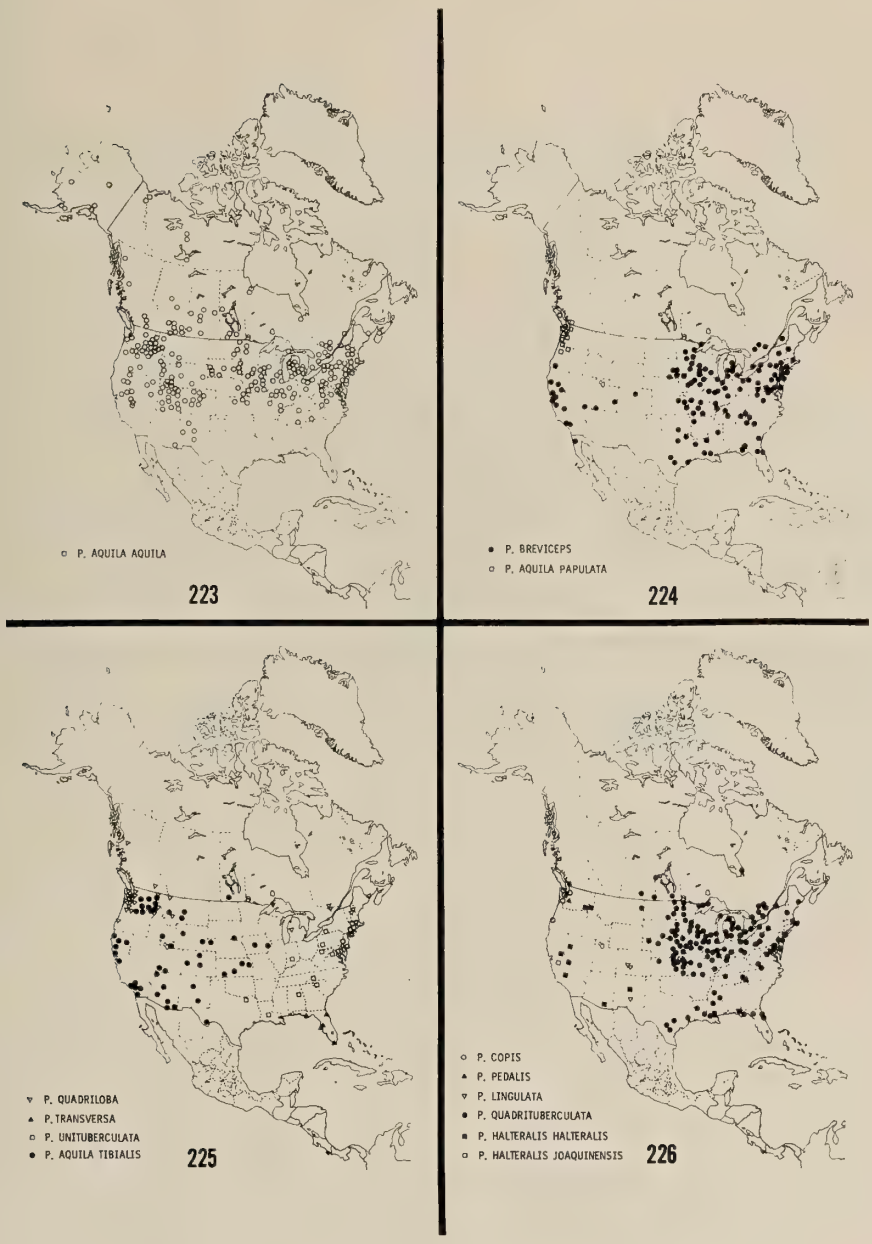
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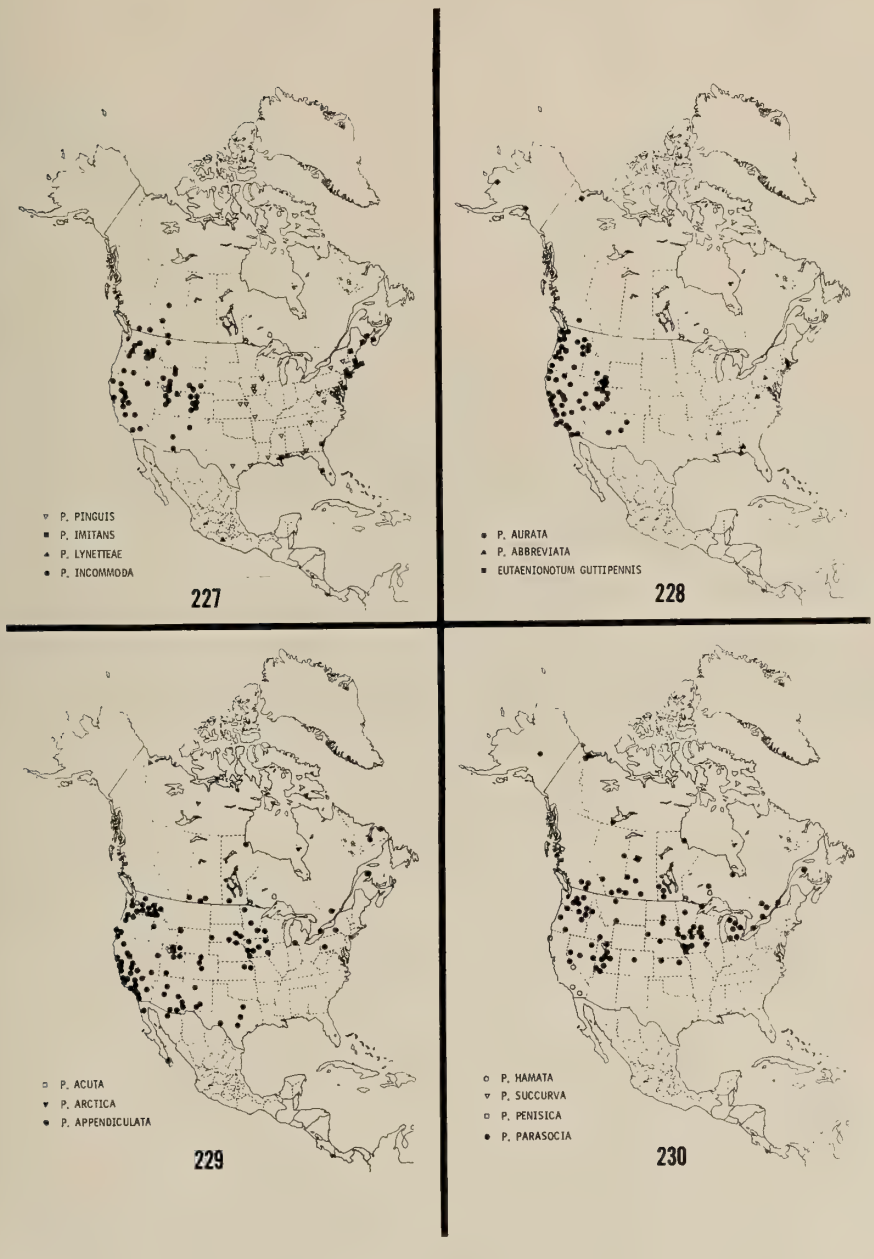
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